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PROCEEDINGS

OF THE

NEBRASKA ORNITHOLOGISTS' UNION

I, II, III

1899-1902

EDITED BY

ROBERT H. WOLCOTT

NELIGH AND LINCOLN,
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NOTE

Reference should be made by readers to the editorial note which precedes the index at the back of the volume.

EDITORIAL NOTE

The publication of these Proceedings was begun by the Union at a time when the status of many species of birds in the state was in question and the right of others to places in the list doubtful; but at a time, too, when such differences of opinion existed that no one member could assume the right, in the absence of conclusive proof, to decide the many problems that presented themselves. Since that time our knowledge of the species found in the state and of their distribution has greatly increased. Much of the knowledge gained has been through the work of field parties sent out by Prof. Bruner of the Department of Entomology and Ornithology of the University of Nebraska, from funds provided by the state. But there has been also much done along this same line through the personal efforts of numerous members, including Messrs. J. M. Bates, M. A. Carriker, Jr., August Eiche, J. S. Hunter, M. H. Swenk, Wilson Tout, I. S. Trostler, and J. E. Wallace, who have worked in their respective localities, and of others, including Messrs. L. Bruner, Merritt Cary, F. H. Shoemaker, and R. H. Wolcott, who have also undertaken trips at private expense. Certain identifications in the first two Proceedings have been shown to be erroneous and the proper corrections are here made.

Oregon Junco; I 17, 26; II 75, 93. All refer to Shufeldt's Junco, *J. hyemalis connectens* Coues.

Olive-backed Thrush; I 18. Should have been Wood Thrush, *H. mustelinus* (Gmel.).

Pomarine Jaeger; I 19. Single specimen taken is a Parasitic Jaeger, *S. parasiticus* (Linn.).

Laughing Gull, Florida Cormorant, Cinnamon Teal, Little Blue Heron; I 19, 20. Erase all.

Laughing Gull (?); II 68. Undoubtedly Franklin's Gull, *L. franklinii* Sw. & Rich.

Little Blue Heron; II 51. Record, based on hearsay, in absence of corroborative evidence, cannot stand.

Meadowlark; I 14, 25; II 32, 59, 72, 81, 92, 99. All references to Meadowlark should be to Western.

Pallid Horned Lark; II 54. Should be Desert H. Lark.

House Wren; I 13, 14, 28; II 30, 58, 93. All references to House Wren should be to Western House Wren, *T. a. aztecus* (Baird).

Pygmy Nuthatch; II 58. Erase.

Yellow-crowned Night Heron; II 59. No doubt referred to Black-crowned.

Barred Owl; II 77. Should have been Western Horned Owl, *Bubo virginianus pallescens* Stone.

Lark Sparrow; II 78, 81. Maryland Yellowthroat; I 18; II 78, 84. All refer to the Western forms of the two species.

Yellow-breasted Chat; II 80, 81. Should be Long-tailed Chat. Chewink; II 81. Should be Arctic Towhee.

Western Nighthawk; II 81. Should be Sennett's Nighthawk.

Vesper Sparrow, Field Sparrow; II 81. Should be Western form of each.

Horned Lark; II 81. Should be Desert Horned Lark.

Traill's Flycatcher; II 77. Specimens taken later at same locality were identified by authorities at Washington as the Alder Flycatcher, *E. t. alnorum* Brewst.

Vol. II, p. 2. The name of Treasurer, L. Bruner, was omitted from the list of officers.

Vol. II, p. 82, line 27. For "Horned Grebe" read "Eared Grebe."

No doubt other corrections should be made but at the present time the condition of our knowledge does not make them seem advisable.

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COMPILED BY M. H. SWENK

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PROCEEDINGS

OF THE

NEBRASKA ORNITHOLOGISTS' UNION

AT ITS

FIRST ANNUAL MEETING

Lincoln, Nebr., Dec. 16, 1899

EDITED BY ROBT. H. WOLCOTT

IN BEHALF OF THE EXECUTIVE COMMITTEE

AND BY AUTHORITY OF THE UNION

Neligh, Nebr.
MERRITT CARY, Printer
January, 1900

1. The SNOW BIRD: *Junco hiemalis.* 2. WHITE-THROATED CROWN SPARROW: *Zonotrichia albicollis.* 3. FOX SPARROW: *Passerella iliaca.* 4. TREE CHIPPING SPARROW: *Spizella monticola.*

(From Agricultural Year Book for 1898).

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FIRST ANNUAL MEETING,
NEBRASKA ORNITHOLOGISTS' UNION.

OFFICERS.

PRESIDENT.....Prof. Lawrence Bruner, Lincoln.
VICE-PRESIDENT.....Mr. I. S. Trostler, Omaha.
RECORDING SECRETARY.....Dr. R. H. Wolcott, Lincoln.
CORRESPONDING SECRETARY.....Mr. W. D. Hunter, Lincoln.
EXECUTIVE COMMITTEE { Chairman, Mr. J. R. Bonwell, Nebr. City. / ..Dean Chas. Fordyce, University Place. / .....Rev. J. M. Bates, Long Pine.

ABSTRACT OF MINUTES.

The meeting was called to order in the Laboratory of the Department of Entomology and Ornithology, Room 103, Hall of Mechanic Arts, the University of Nebraska, at 11:20 a. m., Dec. 16, 1899, President Bruner presiding.

Fourteen persons were present.

Mr. W. D. Hunter read the report of the committee of the local society having in charge the matter of a state organization, showing that 66 persons had signified their willingness to take part in the movement and that 43 of these had voted for officers for the first meeting. The result of the ballot was as follows: President, Prof. Lawrence Bruner; Vice-President, Mr. I. S. Trostler; Recording Secretary, Dr. R. H. Wolcott; Corresponding Secretary, Mr. W. D. Hunter; Executive Committee, Mr. J. R. Bonwell, Rev. J. M. Bates, Dean Chas. Fordyce.

It was moved by Dr. Wolcott that those who participated in the organization of the society be constituted the Nebraska Ornithologists' Union, and that those present in behalf of the Union do formally endorse the action of the committee having in charge the measures leading to the organization of the same.

The draft of a constitution and by-laws prepared by the Executive Committee was, in the absence of the chairman, read by Mr. W. D. Hunter, who also presented a revised draft prepared after an informal conference of several members previous to the meeting. Attention was called to the few changes suggested, and after further minor changes had been proposed and accepted it was moved by Dean Fordyce that the constitution and by-laws as amended be adopted, which motion prevailed.

It seeming desirable that the objects of the Union and its relation to the already existing Nebraska Academy of Sciences be defined, Dr. Wolcott and Mr. Hunter were appointed a committee on resolutions to formulate a statement to that effect.

On motion of Dr. Wolcott it was decided that all who should become qualified as active members by the payment of dues previous to the next annual meeting be considered charter members.

The Corresponding Secretary read the list of those who had previously signified their intention of becoming members.

A communication from Mr. A. C. Tryon of Avoca, Ia., containing propositions by which the "Western Ornithologist", the first number of which is to appear in January, 1900, should become the official organ of the Union, was read, and on motion of Mr. Trostler the communication was received and laid on the table.

The question of publishing the proceedings of the Union was discussed and favorably considered, and a motion prevailed, made by Mr. Trostler and amended by Dean Fordyce, by which the matter was left to the Executive Committee with power to act.

Attention being called to the fact that the officers for the ensuing year could not be chosen in accordance with the provisions of the constitution it was moved by Dr. Wolcott that in compliance with the section providing for the filling of vacancies the Executive Committee prepare a list of officers for the ensuing year, and present a report to the Union previous to the final adjournment. Carried.

On motion the meeting was adjourned at 12:30 to meet again in the afternoon.

The meeting was then called to order at 2:15 p. m., in the same room and by President Bruner, who presented his annual address on "Ornithology in Nebraska".

Forty-nine persons were present.

Dr. Wolcott read the following report from the committee on resolutions:

Whereas, There already exists in this state a Nebraska Academy of Sciences the field of which embraces Ornithology, in order to better define the relationship of the new society to the older organization and to announce more definitely the objects for which the Union is established; and

Since the Nebraska Academy of Sciences concerns itself with the different sciences from a more strictly technical point of view, and aims especially to encourage original investigations concerning the various branches of science; therefore be it

Resolved, That the Nebraska Ornithologists' Union announces its desire to assist the Academy of Sciences so far as may be possible in the prosecution of the work of the latter, but at the same time claims as its own field the extending and the intensifying of the interest in Ornithology throughout the state, and especially in the schools, the fostering of all measures tending to the protection of the bird life of the state, and the collecting of data of all kinds which may be of aid in arriving at a complete knowledge of the Nebraska bird-fauna.

Dr. Wolcott then read a paper on "A Twenty-three Years' Record kept by Dr. A. L. Child, Plattsmouth, Nebr."

Rev. J. M. Bates read a paper on "Further Notes and Observations on the Birds of Nebraska."

Mr. J. S. Hunter read a paper on "The Bird Fauna of the Salt Basin near Lincoln."

In the absence of the author, the Corresponding Secretary read a paper by Mr. Merritt Cary on "Some Bird Notes from the Upper Elkhorn."

Mr. M. A. Carriker, Jr. read a paper "On the Raptores of Otoe County."

Mr. Wilson Tout read a paper on "How to Popularize Ornithology."

Owing to the absence of Mr. Lawrence Skow, a paper by him entitled "A Plea for the English Sparrow" was read by the Corresponding Secretary.

(The discussions provoked by the reading of the several papers will be found following them).

On the suggestion of Rev. Mr. Bates the constitution and by-laws adopted at the forenoon session were read for the benefit of those who were not then present.

Dean Fordyce read the report of the Executive Committee containing nominations of officers for the ensuing year, as follows:

PRESIDENT.....Mr. I. S. Trostler, Omaha.
VICE-PRESIDENT.....Miss Caroline Stringer, Wayne.
RECORDING SECRETARY.....Mr. George E. Condra, Lincoln.
CORRESPONDING SECRETARY.....Mr. W. D. Hunter, Lincoln.
EXECUTIVE COMMITTEE { .....CHAIRMAN, Dr. R. H. Wolcott, Lincoln. / .....Dean Chas. Fordyce, University Place. / .....Rev. J. M. Bates, Long Pine.

Mr. Condra begged to be excused from serving as Recording Secretary on account of press of other work. The report was accepted and adopted, and on motion of Dr. Wolcott the resignation of Mr. Condra was also accepted and Prof. E. H. Barbour made Recording Secretary in his stead.

The program of papers was then concluded by the reading of a paper by Dr. Wolcott on "Suggestions for an Accurate and Uniform System of Recording Observations."

The newly-elected officers were then introduced to the society and President-elect Trostler took the chair.

It was moved and carried that the society extend its thanks to the retiring officers for their labors in behalf of the organization, and especially to Mr. W. D. Hunter, upon whom has fallen the burden of the clerical work in organizing the Union.

Dr. Wolcott announced that Mr. Merritt Cary had offered to print whatever stationery the Union might need free of charge, and the society voted unanimously to accept his generous offer and to tender to him the thanks of the Union.

On motion the society adjourned sine die at 5:45 p. m.

(Signed) ROBT. H. WOLCOTT,
Recording Secretary.

CONSTITUTION AND BY-LAWS.

ARTICLE I. (Name and Object.)

SEC. 1. This association shall be known as The Nebraska Ornithologists' Union.

SEC. 2. Its object shall be to promote the study of ornithology by more closely uniting the students of this branch of natural history in the state of Nebraska.

ARTICLE II. (Members.)

SEC. 1. Members shall be of three classes: active, associate, and honorary.

SEC. 2. Any person residing in Nebraska, not less than sixteen years of age, may become an active member on receiving a majority vote of the members present at any meeting. Members of this class only shall have the right to vote and hold office.

SEC. 3. Any person interested in ornithology may become an associate member on receiving a majority vote of those present at any meeting.

SEC. 4. Honorary members shall be elected for their eminence in ornithology.

ARTICLE III. (Quorum.)

SEC. 1. A quorum for the transaction of business shall be one-fifth of the total active membership.

ARTICLE IV. (Officers and Committees.)

SEC. 1. The officers of this Union shall be: a President, a Vice-President, a Recording Secretary who shall also act as Librarian, a Corresponding Secretary, and a Treasurer.

SEC. 2. There shall be a standing Executive Committee consisting of three members elected by the Union, with the President and Recording Secretary as ex-officio members. The chairman shall be the elected member of the committee that receives the largest number of votes.

ARTICLE V. (Duties of Officers and Committees.)

SEC. 1. Duties of the President. It shall be the duty of the President to preside at all of the meetings of the Union, to appoint all committees not otherwise herein provided for, and to perform such other duties as may properly pertain to the office.

SEC. 2. Duties of the Vice-President. It shall be the duty of the Vice-President to act in the absence or incapacity of the President.

SEC. 3. Duties of the Recording Secretary. It shall be the duty of the Recording Secretary to keep a record of the meetings of the Union, to countersign all orders and documents issued by the President, to superintend the publication of the Proceedings of the Union, to act as Librarian, and to perform such other duties as properly pertain to the office.

SEC. 4. Duties of the Corresponding Secretary. It shall be the duty of the Corresponding Secretary to conduct the general correspondence of the Union, to prepare the program of the meetings, to send out the call for such meetings, and to perform such other duties as properly pertain to the office.

SEC. 5. Duties of the Treasurer. It shall be the duty of the Treasurer to receive and have charge of all moneys of the Union and to pay such bills as are endorsed by the President and Secretary.

SEC. 6. Duties of the Executive Committee. It shall be the duty of the Executive Committee to fix the date of the annual meeting, to fill by temporary appointment offices left vacant by removal or by death, to nominate three persons for each of the several offices that are to be filled annually, and to decide election in case of a tie.

ARTICLE VI. (Election of Officers and Committees.)

SEC. 1. The election of all officers and standing committees shall be by ballot of all the members of the Union through correspondence, and the Corresponding Secretary shall send a list of the nominees of the Executive Committee to each member by the first day of November in each year.

SEC. 2. The term of office shall extend from the end of one annual meeting to the end of the next one.

ARTICLE VII. (Meetings.)

SEC. 1. The annual meeting of the Union shall be held at such place as the majority of the members through correspondence shall select, and at such time as the Executive Committee shall decide.

ARTICLE VIII. (Dues and Assessments.)

SEC. 1. The annual dues of the active members shall be one dollar ($1.00).

SEC. 2. The annual dues of associate members shall be fifty cents ($0.50).

SEC. 3. A general assessment may be levied by a two-thirds vote by mail of all the members.

SEC. 4. In case of failure to pay dues before the close of the year, a member shall forfeit his right to the publications of the Union.

SEC. 5. In case of failure to pay dues for two years a member shall be dropped from the roll of the Union.

ARTICLE IX. (Amendments.)

SEC. 1. An amendment to this constitution may be adopted by a two-thirds vote of the active members, one month notice of proposed amendment having been given.

BY-LAWS.

SEC. 1. The actual amount expended by the officers in carrying on the correspondence of the Union shall be refunded to them.

SEC. 2. All members in standing shall receive gratis one copy of the publications of the Union.

SEC. 3. All papers presented at the meetings shall be the property of the Union and shall be filed with the Librarian.

SEC. 4. The order of business at the annual meeting shall be as follows: 1. Reading of minutes; 2. Reports of officers; 3. Reports of committees; 4. Proposal of names and election; 5. Announcement of election of officers and committees; 6. Presentation and discussion of papers and remarks; 7. Installation of officers; 8. Adjournment.

SEC. 5. Article VIII may be varied at any meeting by a vote of a majority of the members of the Union.

SEC. 6. Application for membership must be made to the Executive Committee and such application must have the endorsement of at least one member in standing, which shall be expected to be a proper recommendation of the candidate.

SEC. 7. Any of the By-laws may be amended or repealed by vote of a majority of the active members.

PAPERS AND DISCUSSIONS.

PRESIDENT'S ADDRESS—ORNITHOLOGY IN NEBRASKA.

PROF. LAWRENCE BRUNER.

You all know that Nebraska is comparatively young and is, therefore, behind some of the other states in a great many ways. Whether or not our state is behind as regards ornithology remains to be seen. In the presentation of this subject today I have no written paper, but shall take up the points I wish to bring before you as they come to me.

In the first place it must be confessed that ornithology in Nebraska is not very old. We have, it is true, some writings on this subject that have appeared from time to time, indicating in a way just what birds have been observed, what their distribution is, something concerning their food habits, a trifle regarding the possibility for the future, etc., but aside from this we are behind a great many other states in a number of ways. We have perhaps fewer workers who are interested in birds in this state than are to be found in some of the neighboring states. Although these workers may be fewer in number, I think there is no doubt that they are more earnest in the work they are doing. Four years ago it was suggested by some one at one of the meetings of the State Historical Society that we as citizens should know a little more about our birds. "If the birds are of any use to us we ought to know it", are the words that were used by the speaker at that time. Accordingly as Entomologist and Ornithologist, and a few other "gists" to the Horticultural Society, I was asked to get together some notes on Nebraska birds that might be of value to the members of the Horticultural Society and others. I myself had been studying birds in a kind of dilatory way for twenty-five years prior to the meeting here referred to, and had accumulated some notes on the species belonging to portions of Nebraska where I happened to be at different times. Letters were also written to the various persons residing in the state who were known to be more or less interested in the study of birds. A list of the names of fifty-six different persons was gotten together and from these persons were obtained the notes that they had made concerning the birds of Nebraska. A compilation of these notes resulted in bringing together a larger list of birds for Nebraska than has been obtained in any other state in the Union. Four hundred and sixteen different species and subspecies, according to this list, had been taken or seen within the present limits of the state. These notes were arranged practically in the form you see them in this pamphlet I hold in my hands. Each person who furnished such notes is given full credit for what he did. The compiler of the notes only holds himself responsible for the references to which his name is attached.

It was further found that, of the 416 different species and subspecies that had been taken in Nebraska, 227 at that time had been found breeding within our boundaries, indicating that at least this number among these are at home in Nebraska, for wherever a bird rears its young there is its

home. If it is not found at home at all seasons of the year it is simply because it has gone visiting, or to winter in some other region with milder climate. A bird is a sort of aristocrat and able to visit different climes. We cannot all go to Florida in winter, but birds can if they so desire. Notwithstanding this habit of many of our birds of retiring to the southward, more than one hundred species have been taken or seen inside our borders during winter, representing the fact that at least this many winter here. Quite a number of these that winter with us also spend the summer here. A few others come to us from the regions farther north and remain over winter.

Now why is it that we have so many birds in Nebraska? I do not like to be referring to that old worn-out subject of the location of Nebraska, the variation in surface configuration of the state, the difference in altitude of different sections, and so on, but I can hardly avoid speaking of these points here. Every one of you upon looking at that map of Nebraska can see that it is located centrally between the floor and ceiling; just about such a position has Nebraska with reference to the rest of the states. In the southeast corner it reaches but little more than 800 feet above tide water; we have a belt of timber along the eastern edge of the state; there are isolated groves immediately back of this with prairie between; and farther on are found broad prairies without timber belts; and still farther west are found plains conditions. We have moist, medium and arid regions in the state. We have mountain, plain, prairie, and forest conditions. The Missouri river with its broad valley is a great roadway for the migrating birds in passing from the south to the north, and from north to south. The branching valleys with their streams extending back towards the west form other roadways for the birds in their distribution over the state. The lakes of the sandhills, and the sandhills themselves, offer retreats for birds that find no suitable home in any other region except these particular localities. You see, as I said, we are half way between the east and the west, the south and the north, and we receive birds from all of these regions. We have nearly all the forms that occur in the eastern states. The eastern edge of Nebraska possesses the same bird fauna as Iowa, Illinois, and other states of like latitude. As we proceed a little farther west we find birds which come into the country from Mexico and reach our central and western regions. These are those that are at home on the Mexican plateau and on the eastern slopes of the Cordilleras of Mexico during portions of the year; and then still farther west we come to the mountain conditions. Diverging from the Rocky Mountains, the Black Hills range extends toward the northeast into South Dakota, and again giving off a spur to the eastward furnishes in Pine Ridge suitable conditions for mountain birds along a great portion of our north and northwestern territory. We also have a number of bird visitors in northwest Nebraska in winter that do not reach western Kansas, or Iowa and regions farther east. Although we have very little water in the shape of lakes and ponds in the state, there are few water birds of the United States not strictly maritime but that reach Nebraska; in fact some seem to be more partial to the waters of our state than to those of more eastern localities.

Although we have done but comparatively little in the way of gathering statistics concerning the birds of Nebraska, we have, as you may readily see, laid a fair foundation for the beginning of a study of these creatures. It has already been acknowledged by the action of the legislature of Nebraska that this state is to take an eminent position among the states of the Union as a bird protector. We have established a Bird Day in our public schools. But two or three other states have done likewise. We were the first to establish Arbor Day; Pennsylvania was the first to establish Bird Day. We came in second or third, I do not remember which. Besides this our Department of Public Instruction has taken up the matter in earnest and distributes each year for Bird Day and Arbor Day a program to be used in all the public schools throughout the state, giving at least one-half of this publication to birds, and the other half to trees, shrubs and flowers. In the University of Nebraska Experiment Station we have always insisted that birds are essential to farmers and fruit growers, and have endeavored to show by publications from time to time that these creatures ought to be protected because of their usefulness. A year ago, or thereabouts, a little bulletin or leaflet called "An Appeal for the Protection of Our Birds", was prepared in this Department. This was not original, but was sent out from the Department for the effect it might have in the direction of bird protection. Up to date something like twenty or twenty-one thousand of these leaflets have been distributed. At least three-quarters or more of our daily and weekly papers have published the bulletin in full; besides, a number of monthly periodicals have copied it and spread it among their readers; hence the citizens of the state begin to conceive the idea that bird protection is not to be a fad but a reality.

I have always maintained that birds are a sort of equalizer in nature, and have frequently made addresses in which it was stated that insects were made for some purpose, and that purpose was "for birds to eat", and that "birds were made to eat insects". Here is an equilibrium for you. If we kill the birds there will be a superabundance of insects; if we permit the insects to increase then the birds will also need to be increased. We must keep the number of birds up in order to keep the insects down. If by any chance we should have more birds than we have insects to feed them with, the birds would simply go to other states for such food.

Now I have conceived the idea that we, as an organization of bird lovers of Nebraska, have a mission before us. Whether I am right in this or not will remain for you to say. While we can study birds with reference to their moulting, their food habits, their migration and other habits, we should, I believe, make bird study something even more than this in our state. It strikes me that we have a mission to bring the study of ornithology into our public schools. Every one of us is intensely interested in this matter, and if we go at it in the right way there is no reason why this organization cannot prepare a manual on Nebraska birds to be used in our schools. There are certainly enough persons in the Union who have sufficient interest, and who are capable of getting together the manuscript for such a manual. Just now we are trying, in fact, not only ourselves, but the entire school system of the state is trying, to introduce what we choose

to call "nature study" into the schools. We in America have dropped behind so far in this respect in comparison with all other countries that we are beginning to be in earnest, and whenever an American is in earnest he moves, and moves rapidly. We have taken up Nature Study as a branch of instruction in our schools. Birds appeal to most people more strongly than do other things in nature. There seems to be a spot in our makeup which is stirred to life whenever birds and bird habits are spoken of. This being true there is certainly a chance for the revival of interest in nature, if we can bring out the matter of birds and bird study in our schools. Besides reviving an interest in nature study I believe we will soon create a sentiment all over the state in favor of the protection of birds. This fact was brought to my notice most forcibly while in South America a couple of years ago. I went out to hire someone to assist me in collecting specimens for the University of Nebraska. There seemed to be only one person available at the time—a Swiss boy about twenty or twenty-one years of age. He was the only one apparently in that region who did not try to kill every bird that came in sight. In speaking to him concerning this trait he said that at home they were taught better than to kill birds. He came to South America when nine years old. I have heard since that everybody in Switzerland is taught to respect bird life. This reminds me that we have a paper on the program by one of our members, a Dane, who makes a plea for the English Sparrow. Now here in this ornithological union, I believe there are comparatively few friends of the House Sparrow, but this man is an exception. He was raised in a country where the good people feed their birds during winter. In Germany they do likewise. Let us take a hint from these nations and take care of our birds too.

Let me now thank you for this honor of being able to make the first official talk to the Nebraska Ornithologists' Union.

A TWENTY-THREE YEARS' RECORD KEPT BY DR. A. L. CHILD OF PLATTSMOUTH, NEB.

DR. R. H. WOLCOTT.

Dr. A. L. Child was born in Rochester, Vt., in August, 1810, and was largely self-educated, though graduated from the Randolph, Vt. Grammar School in 1830. He emigrated to the West in 1833, studied medicine at Cincinnati, O., and practiced his profession for six years; engaged in teaching in different places in Ohio for eight years; and then travelled during the following four years. In April, 1857, he removed to Cass Co., Neb., and went to farming at Glendale. In the fall of 1869, being elected Probate or County Judge, he removed to Plattsmouth, where he resided till 1883, when, we are informed, he removed to Kansas City, Mo. He is now deceased.

He was not a scientific man, according to the ordinary meaning of the term, but was evidently a lover of nature and a close observer of natural phenomena. He was in correspondence, at first with the Smithsonian Institution and later with the U. S. Signal Service, and kept a very full me-

teorological record, beginning in 1858 and continuing, with a partial interruption from 1869 to 1873, till 1883. This record is in the possession of the local U. S. Weather Bureau, and through the courtesy of Mr. G. A. Loveland, the writer has been allowed the privilege of examining it.

Scattered through the pages of this record are numerous references of interest to the biologist—notes on the occurrence of grasshoppers, the time of appearance of flowers and birds in spring, etc.—and at the end is a summary headed "Progress of Seasons". Under this caption a table compiled by Dr. Child, and bearing date Jan. 26, 1874, was printed in the "Omaha Republican", and under the same title was published in the Transactions of the State Board of Agriculture in 1879, a more extended review bringing the record up to the end of that year. In the original record this summary is brought down to the beginning of 1883.

These different summaries agree, except for a few discrepancies due to errors made in transcribing, and excusable in view of Dr. Child's advanced years. The notes in the body of the original record which is under examination, however, are by no means so full or so accurate as in the summaries at the end, and this leads to the natural inference that either it was compared with other records and corrected and amplified by facts obtained from other sources, or else that it was only a part of the record kept by its author. From internal evidence the former supposition seems the more probable, and the probability is increased by the fact that the summary just referred to contains records on birds not included in the published summary of 1879, although antedating by several years the date of publication of the latter. If the other be true, it is most desirable that the missing portion be found and placed where it will be permanently preserved. In either case the writer believes the summary may be accepted essentially as it stands, for Dr. Child was apparently both careful and accurate, and not likely to have published anything not perfectly reliable.

It is interesting to glance through the record. The very cold winters were those of 1859–'60, '72–'73, '74–'75, and '80–'81, and of these '80–'81 was the most severe, the mean temperature for the three winter months being 14.14°, or 7.56° below the normal, and there being thirty-six days during the winter on which the temperature fell to below the zero point. Under date of March 23, '81, is this note: "The first really pleasant day since Nov. 1, 1880—143 days." The winter of '74–'75 was also a noteworthy one; under date of Feb. 17—"The mean temperature since Dec. 28, to date, fifty-one days, is 7.50°!!!". The very warm winters were those of '02–'03, '75–'76 and '77–'78, the mean for '75–'76 being 7.47° above the normal, and that for '77–'78, 11.31° in excess, while in each one of the three seasons the temperature reached zero only three times. January of 1880 was much the warmest January recorded, the mean for the month exceeding the normal by 14.54°, and during the month Dr. Child noted Bluebirds, Robins, Phoebes and Sparrows. On the 8th he says, "Ground thawed out in many places and spring-like weather, birds, etc., prevail"; on the 25th, "A tint of green on cottonwood timber."

Of the springs, those of '58, '60, '63, '76 and '78 were particularly early, and those of '62, '67 and '81 especially late; while the warmest springs as a

whole were those of '68, '78 and '79, and the coldest those of '67 and '72. March, 1867, was the coldest March recorded. "The coldest March reported by the Agricultural Department in Annual Reports since 1853 was that of Vermont in 1863, viz: 19.8°. Our present March is 2.89° below that, and 21°!!! lower than the average of 9 years past." On June 2nd and 3d, 1867, we read, "The first real spring or summer days this season." "As March of 1867 was an unprecedented cold one so March of 1868 was an equally extreme warm one. 26.94° difference!!" The warmest March recorded was that of 1878; on the 26th peaches and gooseberries were in bloom.

The appearance of birds in spring is shown in the "Summary" which follows, and which is an exact copy of the original, except that one species is omitted, the "Sparrow", under which name several species were evidently confused, that in several places where comparison with the body of the record makes it evident that errors in transcribing were made such are corrected, and that additions were made from the same source.

First Appearance of Birds in Spring

	Robin	House Wren	Bobolink	Swallow	Catbird	Bluebird	House Martin	Whip-poorwill	Kingbird	Summer Yellow Bird	Chewink	Pewee	Baltimore Oriole
'58	Mar 22												
'59	Apr 17	Apr 25		May 5									
'60	Mar 4	May 4	May 10	May 12	May 4								
'61	Apr 3	Apr 24	May 8	May 10	May 4								
'62	Mar 20	May 3	May 12	May 9	May 4								
'63	Apr 1	May 30	May 7	Apr 30	May 4								
'64	Apr 10	May 3	May 3	May 9	May 4								
'65	Apr 13	May 29	May 8	May 4	May 4								
'66—Apr 20		May 7	May 8	May 10	Apr 29	Apr 7							
'67	Apr 23	May 1	May 11	May 10	May 11								
'68—Mar 28		Apr 29	May 1	May 8	May 1								
'69	Mar 25	May 1	May 8	May 10	May 11								
'70—Mar 7		Apr 27	May 13	May 28	Apr 29								
'71	Apr 7	May 30	May 1	May 3	May 8								
'72—	Apr 18	May 28	May 11	Apr 25	Apr 29	Mar 25							
'73	May 1	May 6	May 14	May 18	May 8	Mar 5							
'74—Mar 1		May 1	May 8	May 5	May 8	Mar 29	Apr 27	May 8					
'75	Mar 13	Apr 17	May 1	Apr 1	Mar 30	Mar 13	May 8	May 1					
'76—Feb 19		Apr 22	Apr 27	May 4	Feb 19	May 1	Apr 21	May 6					
'77	Feb 19	Apr 20	May 3	Apr 20	Feb 3	Apr 28	Apr 20	May 7					
'78—Mar 1		Apr 18	May 1	May 4	May 1	Feb 15	Apr 10	May 1					
'79—Feb 4		Apr 24	Apr 29	May 9	Apr 22	Jan 24	Apr 15	May 2					
'80	All w'r	Apr 22	May 1	Apr 22	All w'r	Apr 23	Apr 21	May 3					
'81	Mar 23	Apr 24	Apr 26	Apr 14	Mar 6	Apr 14	Apr 18	Apr 24					
'82	Feb 10	Apr 19		Apr 26	Feb 20	Feb 10	Apr 18						
								May 1					
										Apr			
											Apr 7	Mar 18	May 3

The discrepancies existing between the summary and the original record were, in the case of the Swallow and the Catbird, so radical that the writer did not feel justified in making them in the table but will add here the dates obtained from the latter source. For the Swallow they are Apr. 16, '66; Apr. 26, '67; May 1, '68; Apr. 28, '69; Apr. 29, '72; May 1, '74; May 15, '75. For the Catbird, Apr. 28, '66; May 8, '67; May 1, '68; Mar. 28, '69 (probably an error); Apr. 28, '72; Apr. 27, '73; Apr. 30, '74; May 14, '75; Apr. 26, '76; May 1, '77; Apr. 18, '78.

"Of the birds, the Blue Jay, Robin and Bluebird can hardly be termed migratory, as at most any time during the winter a few warm days will bring them around us; to leave again if it becomes too cold."—Trans. State Board Agr. for 1879.

In this summary the "Swallow" is the White-bellied Swallow (*Tachycineta bicolor* Vieill.), the "House Martin" doubtless the Purple Martin (*Progne subis* Linn.), and the "Pewee" is the Phoebe (*Sayornis phœbe* Lath.).

The average date of arrival of any species may be reckoned by counting for each year the number of days from the earliest recorded date to the date for that year, averaging these figures, and then adding to the earliest recorded date the number of days corresponding to the average so obtained. Thus for the Robin, during twenty years the earliest recorded date is Feb. 3, '77, the latest Apr. 20, '67, the average obtained 41, or the average date of arrival Mar. 16. It is evident that to take a date midway between the earliest and latest dates would lead to error, for it would give an undue effect to a very early or a very late date, which may have been in the one case due to an accident, and in the other to deficient observation. In this computation winter dates are neglected since it is only the migrants with which we are dealing.

This method gives the following average dates of appearance, taking the summary as printed above:

Bluebird,	Av. of 11 yrs.	Mar. 1		Catbird,	Av. of 23 yrs.	May 1	
Robin,	" 20 "	" 16		Bobolink,	" 14 "	" 3	
Phoebe,	" 10 "	" 22		Kingbird,	" 14 "	" 4	
Chewink,	" 13 "	" 31		Balt. Oriole,	" 6 "	" 5	
Purp. Martin,	" 9 "	Apr. 20		White-bellied			
Whip-poor-will,	" 12 "	" 25		Swallow,	" 24 "	" 8	
Wren,	" 24 "	" 28		Yel. Warbler,	" 8 "	" 9	

If the dates afterward given for the Swallow and Catbird be substituted for those in the summary, the dates become, respectively, May 5 and April 30, or practically the same as above.

Other dates appear here and there in the record. Aside from those for "Plover", "Cranes", "Geese", "Ducks", "Yellowhammers", "Ground Sparrows", "Flickers" and "Chickadees", all of which are either resident throughout the year or not referable to any particular species, we find the dates which follow: Meadow Lark, Mar. 19, '66, Apr. 7, '67, Mar. 16, '68, Mar. 27, '69, Apr. 29, '73, Apr. 10, '74; Chipping Sparrow, Mar. 22, '66; Kingfisher, Mar. 27, '66, Apr. 6, '67, Mar. 23, '68, Apr. 8, '69; Mourning Dove, Apr. 20, '66; Woodcock, Apr. 7, '67; Nighthawk, Mar. 26, '69, May

16, '74; Hummingbird, May 16, '80.

Under date Mar. 17, 1879, we find this note: "Earlier flocks of Wild Geese and Brants usually make this a halting place in both their northward and southward passage and feed in the cornfields till the spring or winter, as the season may be, is more fully settled. Late flocks pass very high, directly on, with no halt. This morning a large flock, very high, passed on their return south. Very noisy and excited, yet with no delay. They seemed to feel that they had been badly fooled and were returning to await more springlike weather!". And under date of May 7, the same year: "Very singular appearance of Wild Geese or Brants. Immense flocks of many thousands going directly north, very high. The usual season for this direct passage is from March 1st to April 10th, in flocks not often exceeding 30 or 40. But today the flocks often contained hundreds, and flocks spread east and west as far as the eye could reach. They were passing over for nearly a half hour."

ADDITIONAL NOTES AND OBSERVATIONS ON THE BIRDS OF NORTHERN NEBRASKA.

REV. J. M. BATES.

In 1896, I gave to Prof. Bruner my notes and observations on the birds of Northern Nebraska, centering in Valentine and Cherry Co., and covering eight years. During that time, as since then, I had been reporting the migration of birds to the Division of Ornithology at Washington, and studying with the aid of Ridgway's Manual, Coues' "Birds of the Northwest", and such other helps as I could obtain without too great outlay. Two years ago a lad in Long Pine High School, Will Smith, became much interested in ornithology, partly, I trust, through my influence, and his co-operation has been of great value in pushing the investigations. Several of the birds enumerated below would have been still unobserved by me without his assistance. I present here a few notes, chiefly in regard to ranges, that will have some value in a revised edition of "Nebraska Birds", and may have an interest for the present hearers. I will make use of numbers as well as Latin and English names, in case any present should wish to open their books and follow me.

4. *Colymbus nigricollis californicus* (Heerm.) —American Eared Grebe. Two were shot south of Long Pine, May 18, '99, by Will Smith.

125. *Pelecanus erythrorhynchos* Gmel.—American White Pelican. June 5, '97, I saw 15 on a lake south of Wood Lake, Cherry Co. The season was very late, and perhaps that accounts for their delay in moving north.

139. *Nettion carolinensis* (Gmel.)—Green-winged Teal. Winters in Cherry Co. Shot in January by Lieut. Stotsenburg, my lamented friend.

147. *Aythya vallisneria* (Wils.)—Canvas-back Duck. Bred at Irwin in '96 and '97, and Hackberry Lake in '97, the young being shot Sept. 1.

151. *Clangula clangula americana* (Bonap.)—American Golden-eye. Winters in upper parts of Long Pine Creek. Shot Dec. 10, '96.

169. *Chen hyperborea* (Pall.)—Lesser Snow Goose. Arrives earlier than Canada Goose, often about Sept 4.

181. *Olor buccinator* (Rich.)—Trumpeter Swan. Used to breed on Watt's Lake, 25 miles south of Valentine, when the ranches were new and few; also on Swan Lake, at the head of the Little Blue.

194. *Ardea herodias* Linn.—Great Blue Heron. In the spring of '97 I saw one several times on Pine Creek.

208. *Rallus elegans* Aud.—King Rail. Reported to me as on Ballard's Lake, Sept., '98.

225. *Recurvirostra americana* Gmel.—American Avocet. Breeds just across the line in South Dakota, 30 miles northwest of Valentine, and undoubtedly in the state.

230. *Gallinago delicata* (Ord)—Wilson's Snipe. A pair seen May 18, '99, at Merriman, indicating the possibility of breeding there.

233. *Micropalma himantopus* (Bonap.) Stilt Sandpiper. Shot at Long Pine, as well as in Cherry Co.

240. *Tringa fuscicollis* Vieill.—White-rumped Sandpiper. Not uncommon at Long Pine, May 25.

241. *Tringa bairdii* (Coues)—Baird's Sandpiper. Bishop Graves sent me a skin taken at Kearney, '99.

246. *Ereunetes pusillus* (Linn.)—Semipalmated Sandpiper. Seems to be considered rare, but shot at Long Pine as well as Valentine.

283. *Arenaria interpres* (Linn.)—Turnstone. Shot by Will Smith 20 miles south of Long Pine, May 19, '99. Only two records in our Report, both from Lincoln. So far as I can ascertain the Spotted and the Solitary are the only true Sandpipers that breed in our portion of the state.

334a. *Accipiter atricapillus striatulus* Ridgw.—Western Goshawk. One was shot at Kennedy, Cherry Co., Oct., '96, and I think is common out there.

342. *Buteo swainsoni* Bonap.—Swainson's Hawk. Almost as common as the Marsh Hawk, and undoubtedly breeds.

343. *Buteo latissimus* (Wils.) - Broad-winged Hawk. Shot and mounted about 12 years ago, at Long Pine.

347a. *Archibuteo lagopus sancti-johannis* (Gmel.) American Rough-legged Hawk. Killed in Cherry Co.

348. *Archibuteo ferrugineus* (Licht.)—Ferruginous Rough-leg. Killed at Kennedy, Nov., '98, and wintering there.

357. *Falco columbarius* Linn.—Pigeon Hawk. Shot at Long Pine, Dec. 29, '97, a large female. Whether it sometimes winters I do not know.

360. *Falco sparverius* Linn.—Sparrow Hawk. Breeds at Long Pine in Cliff Swallow holes, with Rough-winged Swallows.

367. *Asio accipitrinus* (Pall.)—Short-eared Owl. Breeds on open prairie at Long Pine.

373. *Megascops asio* (Linn.)—Screech Owl. Breeds at Long Pine.

388. *Coccyzus erythropthalmus* (Wils.)—Black-billed Cuckoo. At Long Pine, May 9, '97. Seems to be rare.

390. *Ceryle alcyon* (Linn.)—Belted Kingfisher. Winters on Pine Creek.

393. *Dryobates villosus* (Linn.)—Hairy Woodpecker. Shot at Long Pine, Dec. 29, '97, and winters.

394. *Dryobates pubescens medianus* (Swains.)—Downy Woodpecker. At Long Pine, April 10, '96.

408. *Melanerpes torquatus* (Wils.)—Lewis's Woodpecker. Winters at Long Pine and Valentine, but rare.

413. *Colaptes cafer* (Gmel.)—Red-shafted Flicker. Winters at Long Pine, being seen Feb. 6, '97, at 20 degrees below zero.

417. *Antrostomus vociferus* (Wils.)—Whippoorwill. Very rare, being seen once in Cherry Co., and once in Long Pine canyon.

423. *Chætura pelagica* (Linn.)—Chimney Swift. Breeds at O'Neill and Atkinson, and I am confident that I saw it several years ago at Long Pine.

432. *Selasphorus platycercus* (Swains.)—Broad-tailed Hummingbird. At Bassett, Sept. 10, '99, I had the pleasure of watching one of these little

beauties, and by observing it both sitting and flying, took in the points so that I had no difficulty in identifying it next day, on reaching home, as a female Broad-tail. They are very rare with us. Whether the Ruby-throat is found with us is a question not answered, as my note in Prof. Bruner's Report is only a guess at the species, and may have been the same thing seen many years ago at Valentine.

457. *Sayornis saya* (Bonap.)—Say's Phœbe. After seeing and hearing one of these flycatchers in Chadron and Valentine, and wondering what it could be, I succeeded in shooting one on May 9, '98, on the roof of the government building in Valentine without getting the authorities after me. The boys in Chadron declared that it bred there. I think I saw it only April 11, in Chadron.

488. *Corvus americanus* Aud.—Common Crow. I do not know of its breeding west of Grand Rapids, on Niobrara River, north of Stuart.

491. *Nucifraga columbiana* (Wils.)—Clarke's Nutcracker. One was taken at Long Pine with a wounded wing, Sept. 29, '98. We afterwards learned that there was a flock of 20 at a ranch 20 miles southwest.

492. *Cyanocephalus cyanocephalus* (Wied)—Piñon Jay. Breeding at Holly, Sheridan Co., north of Rushville, July 15, '97.

508. *Icterus bullocki* (Swains.)—Bullock's Oriole. Very common at Long Pine.

509. *Scolecophagus carolinus* (Müll.)—Rusty Blackbird. Remains at Long Pine as late as Nov. 3.

511b. *Quiscalus quiscula æneus* (Ridgw.)—Bronzed Grackle. I found a nest last summer 4 feet from the ground in a pine that was about 5 feet high. I had always supposed they built in the tops of large pines.

515. *Pinicola enucleator canadensis* (Cab.)—Pine Grosbeak. Shot March 1, '99, in Long Pine canyon.

521. *Loxia curvirostra minor* (Brehm)—American Crossbill. Shot at Long Pine, Nov. 2, '98, feeding with *Junco hyemalis* on hemp seed in the canyon.

528. *Acanthis linaria* (Linn.)—Common Redpoll. Shot Feb. 2, '97, in Long Pine canyon. Seen since, in small flocks, at Kennedy. A common winter visitor.

—— *Passer domesticus* (Linn.)—English Sparrow. Has gone out to the ranches, 30 miles from Valentine, and has taken the railroad through to the end of the state.

560. *Spizella socialis* (Wils.)—Chipping Sparrow. I never took one of these birds until July 20, '99, and cannot tell whether they are common or strangers.

563a. *Spizella pusilla arenacea* Chadb.—Western Field Sparrow. This extremely shy and interesting bird has been very common around our streams this year. Reported by me but once before, and by no one else.

567. *Junco hyemalis* (Linn.)—Junco. Taken at Long Pine. I have the impression that the Oregon Junco is the more abundant with us, but it needs further study.

581. *Melospiza fasciata* (Gmel.)—Song Sparrow. In Long Pine canyon, but rare, I think.

595. *Zamelodia ludoviciana* (Linn.)—Rose-breasted Grosbeak. Long Pine canyon, May 16, '99. Surely very rare in our parts.

596. *Zamelodia melanocephala* (Swains.)—Black-headed Grosbeak. Nesting in a hedge at Long Pine, June 14, '99, and not uncommon.

597a. *Guiraca cærulea lazula* (Lesson)—Western Blue Grosbeak. In Cherry Co., June 7, '93, and I think also in July this year.

615. *Tachycineta thalassina* (Swains.)—Violet-green Swallow. It may be of interest to state that I found this bird at Newcastle, Wyo., in '96, and have never seen it anywhere else. According to all accounts it ought to be found in my range.

617. *Stelgidopteryx serripennis* (Aud.)—Rough-winged Swallow. Common in Long Pine canyon.

624. *Vireo olivaceus* (Linn.)—Red-eyed Vireo. Very common in Long Pine canyon.

681. *Geothlypis trichas* (Linn.)—Maryland Yellow-throat. Breeds in Long Pine canyon.

703. *Mimus polyglottos* (Linn.)—Mockingbird. Sent me from Kearney last July—therefore breeding.

727. *Sitta carolinensis* Lath.—White-bellied Nuthatch. Long Pine canyon.

728. *Sitta canadensis* Linn.—Red-bellied Nuthatch. Nov. 2, Long Pine canyon.

754. *Myadestes townsendii* (Aud.)—Townsend's Solitaire. Winters in Long Pine canyon, from Oct. 20 to March 22.

758a. *Hylocichla ustulata swainsoni* (Cab.)—Olive-backed Thrush. Our book has no note of its breeding, but it bred abundantly in Long Pine canyon this year.

766. *Sialia sialis* (Linn.)—Bluebird. I hear that it breeds a little in our vicinity. I shot one about Sept. 1, '98, that was evidently immature, but may have been migrating thus early.

The progress that we have been able to make, with very little time to give the subject, since the publication of Prof. Bruner's Report, shows that there is much still to be done in the investigation of range, breeding habits, and relative abundance of species and varieties, as well as of their economic relations to man. The present condition of our knowledge is perhaps not without credit to our state, but it can certainly be much increased by this diffusion of what we have, and the collection of that which is in the possession of isolated individuals, through the workings of this Union, which has now brought us bird-lovers together for the first time.

THE BIRD FAUNA OF THE SALT BASIN, NEAR LINCOLN.

MR. J. S. HUNTER.

A few miles west of Lincoln is a small lake about three-quarters of a mile long and half a mile wide, covering about two hundred acres. The banks slope gradually to the water, and are covered with a scant growth of grass. The water averages between two and three feet in depth. This body of water is called by hunters "The Lake", and by society people "Burlington Beach". It is a semi-natural lake. Formerly there was a salt basin, in which there was very little water and a great deal of mud. Then a scheme was devised to make a lake for a pleasure resort, so across the lower end of the basin a dam was built, and at the upper end a channel dug connecting with Oak Creek. The water is very salty and supports comparatively little plant or animal life.

But during the fall and spring migrations of the water fowl it seems to be a very attractive spot for them. During the two seasons there is scarcely a day but that one may see one or more flocks of ducks or geese, and numerous shore birds. There is so little concealment that the ducks do not have much trouble in keeping out of range of a gun. Most ducks are killed from boats. Two local hunters the past fall killed 157 ducks of various species during six afternoons in a boat. Days when, in a twenty or thirty miles' tramp along the creeks one will not see a duck, there will

be several nice flocks at the lake. I have seen quite often as many as four or five thousand ducks on the water at one time.

The following list is made up of my own and the records of other members of the local Bird Club.

3. *Colymbus auritus* Linn.—Horned Grebe. Frequent.
4. *Colymbus nigricollis californicus* (Heerm.)—American Eared Grebe. Frequent.
6. *Podilymbus podiceps* (Linn.)—Pied-billed Grebe. Common.
7. *Gavia imber* (Gunn.)—Loon. Uncommon.
36. *Stercorarius pomarinus* (Temm.)—Pomarine Jæger. Very rare.
51a. *Larus argentatus smithsonianus* Coues—Herring Gull. Rare.
54. *Larus delawarensis* Ord—Ring-billed Gull. Uncommon.
58. *Larus atricilla* Linn.—Laughing Gull. Frequent.
59. *Larus franklinii* Sw. & Rich.—Franklin's Gull. Common.
60. *Larus philadelphia* (Ord)—Bonaparte's Gull. Uncommon.
64. *Sterna caspia* Pall.—Caspian Tern. Very rare.
69. *Sterna forsteri* Nutt.—Forster's Tern. Uncommon.
70. *Sterna hirundo* Linn.—Common Tern. Uncommon.
74. *Sterna antillarum* (Less.)—Least Tern. Uncommon.
77. *Hydrochelidon nigra surinamensis* (Gmel.)—Black Tern. Common.
120. *Phalacrocorax dilophus* (Swains.)—Double-crested Cormorant. Rare.
120a. *Phalacrocorax dilophus floridanus* (Aud.)—Florida Cormorant. Rare.
125. *Pelecanus erythrorhynchos* Gmel.—American White Pelican. Frequent.
129. *Merganser americanus* (Cass.)—American Merganser. Rare.
130. *Merganser serrator* (Linn.)—Red-breasted Merganser. Rare.
131. *Lophodytes cucullatus* (Linn.)—Hooded Merganser. Frequent.
132. *Anas boschas* Linn.—Mallard. Common.
133. *Anas obscura* Gmel.—Black Duck. Uncommon.
135. *Chaulelasmus streperus* (Linn.)—Gadwall. Common.
137. *Mareca americana* (Gmel.)—Baldpate. Uncommon.
139. *Nettion carolinensis* (Gmel.)—Green-winged Teal. Common.
140. *Querquedula discors* (Linn.)—Blue-winged Teal. Common.
141. *Querquedula cyanoptera* (Vieill.)—Cinnamon Teal. Very rare.
142. *Spatula clypeata* (Linn.)—Shoveller. Common.
143. *Dafila acuta* (Linn.)—Pintail. Common.
144. *Aix sponsa* (Linn.)—Wood Duck. Frequent.
146. *Aythya americana* (Eyt.)—Redhead. Frequent.
147. *Aythya vallisneria* (Wils.)—Canvas-back. Frequent.
149. *Aythya affinis* (Eyt.)—Lesser Scaup Duck. Frequent.
150. *Aythya collaris* (Donov.)—Ring-necked Duck. Very rare.
151. *Clangula clangula americana* (Bonap.)—American Golden-eye. Very rare.
153. *Charitonetta albeola* (Linn.)—Buffle-head. Common.
163. *Oidemia americana* Swains.—American Scoter. Very rare.
165. *Oidemia deglandi* Bonap.—White-winged Scoter. Rare.
166. *Oidemia perspicillata* (Linn.)—Surf Scoter. Rare.
167. *Erismatura jamaicensis* (Gmel.)—Ruddy Duck. Common.
169. *Chen hyperborea* (Pall.)—Lesser Snow Goose. Common.
169a. *Chen hyperborea nivalis* (Forst.)—Greater Snow Goose. Frequent.
169.1. *Chen cærulescens* (Linn.)—Blue Goose. Rare.
171a. *Anser albifrons gambeli* (Hartl.)—American White-fronted Goose. Rare.
172. *Branta canadensis* (Linn.)—Canada Goose. Common.

172a. *Branta canadensis hutchinsii* (Rich.)—Hutchins's Goose. Common.
180. *Olor columbianus* (Ord)—Whistling Swan. Rare.
181. *Olor buccinator* (Rich.)—Trumpeter Swan. Rare.
190. *Botaurus lentiginosus* (Montag.)—American Bittern. Common.
191. *Ardetta exilis* (Gmel.)—Least Bittern. Rare.
194. *Ardea herodias* Linn.—Great Blue Heron. Uncommon.
197. *Ardea candidissima* Gmel.—Snowy Heron. Rare.
200. *Ardea cærulea* Linn.—Little Blue Heron. Rare.
201. *Ardea virescens* Linn.—Green Heron. Common.
202. *Nycticorax nycticorax nævius* (Bodd.)—Black-crowned Night Heron. Common.
204. *Grus americana* (Linn.)—Whooping Crane. Rare.
206. *Grus mexicana* (Müll.)—Sandhill Crane. Rare.
212. *Rallus virginianus* Linn.—Virginia Rail. Common.
221. *Fulica americana* Gmel.—Coot. Common.
223. *Phalaropus lobatus* (Linn.)—Northern Phalarope. Uncommon.
224. *Steganopus tricolor* (Vieill.)—Wilson's Phalarope. Common.
225. *Recurvirostra americana* Gmel.—American Avocet. Uncommon.
230. *Gallinago delicata* (Ord)—Wilson's Snipe. Infrequent.
231. *Macrorhamphus griseus* (Gmel.)—Dowitcher. Infrequent.
232. *Macrorhamphus scolopaceus* (Say)—Long-billed Dowitcher. Infrequent.
233. *Micropalama himantopus* (Bonap.)—Stilt Sandpiper. Uncommon.
234. *Tringa canutus* Linn.—Knot. Very rare.
239. *Tringa maculata* Vieill.—Pectoral Sandpiper. Uncommon.
240. *Tringa fuscicollis* Vieill.—Bonaparte's Sandpiper. Common.
241. *Tringa bairdii* (Coues)—Baird's Sandpiper. Very common.
243a. *Tringa alpina pacifica* (Coues)—Red-backed Sandpiper. Very rare.
246. *Ereunetes pusillus* (Linn.)—Semipalmated Sandpiper.
248. *Calidris arenaria* (Linn.)—Sanderling. Rare.
249. *Limosa fedoa* (Linn.)—Marbled Godwit. Infrequent.
251. *Limosa hæmastica* (Linn.)—Hudsonian Godwit. Infrequent.
254. *Totanus melanoleucus* (Gmel.)—Greater Yellow-legs. Uncommon.
255. *Totanus flavipes* (Gmel.)—Yellow-legs. Common.
256. *Helodromas solitarius* (Wils.)—Solitary Sandpiper. Frequent.
258a. *Symphemia semipalmata inornata* Brewst.—Western Willet. Infrequent.
261. *Bartramia longicauda* (Bechst.)—Bartramian Sandpiper. Frequent.
262. *Tringites subruficollis* (Vieill.)—Buff-breasted Sandpiper. Uncommon.
263. *Actitis macularia* (Linn.)—Spotted Sandpiper. Uncommon.
270. *Squatarola squatarola* (Linn.)—Black-bellied Plover. Uncommon.
272. *Charadrius dominicus* Müll.—Golden Plover. Frequent.
273. *Ægialitis vocifera* (Linn.)—Killdeer. Common.
274. *Ægialitis semipalmata* Bonap.—Semipalmated Plover. Common.
277a. *Ægialitis meloda circumcincta* Ridgw.—Belted Piping Plover. Rare.
283. *Arenaria interpres* (Linn.)—Turnstone. Very rare.

DISCUSSION.

DR. H. B. WARD: "It is perhaps a very minor point, but of some importance in accounting for the birds at the lake, that the water is compara-

tively rich in the minute life upon which many of the water-birds feed extensively. It has been found that the amount of such material in the water is relatively large, although the visible animal and plant life of the lake is small. I do not doubt that the water-birds find pretty good feeding there in spite of the apparent barrenness of the water."

SOME BIRD NOTES FROM THE UPPER ELKHORN.

MR. MERRITT CARY.

It might be well to state in the beginning that, while I have entitled this paper "Some Bird Notes from the Upper Elkhorn", the actual locality in which the notes have been collected is Neligh. However, as Neligh is situated in nearly the center of the Upper Elkhorn Valley, the topography of which varies but little, these notes will doubtless give you a good idea of the avifauna of the region in general.

This list of Neligh birds, incomplete as it is, is the result of no little labor, the greater portion of my spare time during the past four years having been employed in its compilation. But it has been a labor of love, and has afforded me rare enjoyment. I present the list with the hope that it may be an incentive toward the compilation of more local lists, of which we are in great need; and also that it may at least more definitely fix the range limits of some migratory species.

Following is the list, arranged in the order adopted by the American Ornithologists' Union in its Check-List:

4. *Colymbus nigricollis californicus* (Heerm.)—American Eared Grebe. Not common. Seen only during the spring migration, in the latter part of April.

6. *Podilymbus podiceps* (Linn.)—Pied-billed Grebe. Common migrant. Arrives early in April and leaves in November. Have seen them in summer, and a few doubtless breed in favorable localities.

69. *Sterna forsteri* Nutt.—Forster's Tern. One seen in October, '98.

77. *Hydrochelidon nigra surinamensis* (Gmel.)—Black Tern. A regular migrant. Arrives May 5 to 15; leaves in latter part of August.

120. *Phalacrocorax dilophus* (Swains.)—Double-crested Cormorant. A lone straggler killed on the Elkhorn in Nov., '96; also May 15, '99.

125. *Pelecanus erythrorhynchos* Gmel.—American White Pelican. Migratory, not very common. Several killed at Neligh during the early nineties. Oct. 25, '98; Apr. 3, '99.

129. *Merganser americanus* (Cass.)—American Merganser. Migratory, common. Arrives early in April, leaves Oct. 25 to Nov. 5.

130. *Merganser serrator* (Linn.)—Red-breasted Merganser. Rather a rare migrant. Nov. 6, '96; Apr. 19, '99.

131. *Lophodytes cucullatus* (Linn.)—Hooded Merganser. A male killed on the Elkhorn in Nov., '97.

132. *Anas boschas* Linn.—Mallard. Migratory, common, a few remaining to breed. Arrives Feb. 25 to Apr. 1; leaves Oct. 15 to Nov. 20.

135. *Chaulelasmus streperus* (Linn.)—Gadwall. Common migrant. Mar. 15 to Apr. 15; Oct. 10 to Nov. 1.

137. *Mareca americana* (Gmel.)—Baldpate. Abundant during migrations. Same dates as preceding.

139. *Nettion carolinensis* (Gmel.)—Green-winged Teal. Our commonest duck in early spring and late fall. Sometimes seen in midwinter. Feb. 25 to Apr. 1; Sept. 9 to Nov. 20.

140. *Querquedula discors* (Linn.)—Blue-winged Teal. An abundant migrant and breeder. Arrives Apr. 1 to 15, breeds in June, and leaves Sept. 10 to Oct. 15.

142. *Spatula clypeata* (Linn.)—Shoveller. Common migrant and summer resident. Same dates as last.

143. *Dafila acuta* (Linn.)—Pintail. Migratory, abundant. Usually first duck to arrive in spring. Feb. 25 to Apr. 1; Sept. 25 to Nov. 10.

144. *Aix sponsa* (Linn.)—Wood Duck. Summer resident, common. Apr. 1 to Oct. 20.

146. *Aythya americana* (Eyt.)—Redhead. Migratory, not common. Mar. 1 to 30; Oct. 15 to Nov. 20.

147. *Aythya vallisneria* (Wils.)—Canvas-back. Rare migrant. Same dates as preceding.

148. *Aythya marila* (Linn.)—American Scaup Duck. Migratory, common. March 10 to 30; Oct. 20 to Nov. 20.

149. *Aythya affinis* (Eyt.)—Lesser Scaup Duck. Common during migrations. Same dates as last.

151. *Clangula clangula americana* (Bonap.)—American Golden-eye. Rare migrant. Mar. 5, '98; Mar. 25, '99.

153. *Charitonetta albeola* (Linn.)—Bufflehead. Migratory, not very common. Nov. 10, '96; Apr. 18, '99.

154. *Harelda hyemalis* (Linn.)—Oldsquaw. A female was shot by me in Oct., '98.

167. *Erismatura jamaicensis* (Gmel.)—Ruddy Duck. Common migrant. Oct. 20 to Nov. 10; Mar. 15 to Apr. 1.

169. *Chen hyperborea* (Pall.)—Lesser Snow Goose. Migratory, common. Arrives last of March, and leaves Oct. 15 to Nov. 20.

171a. *Anser albifrons gambeli* (Hartl.)—American White-fronted Goose. Rare migrant, arriving in April and leaving in November.

172. *Branta canadensis* (Linn.)—Canada Goose. An abundant migrant. Feb. 25 to Mar. 30; Oct. 15 to Nov. 20. Has been seen in January.

172a. *Branta canadensis hutchinsii* (Rich.)—Hutchins's Goose. Migratory, common. Same dates as last.

180. *Olor columbianus* (Ord)—Whistling Swan. A not uncommon migrant, arriving in March. Not noted in fall.

190. *Botaurus lentiginosus* (Montag.)—American Bittern. Summer resident, common. Apr. 1 to 15; Oct. 10 to Nov. 1.

191. *Ardetta exilis* (Gmel.)—Least Bittern. Very rare. One seen in April, '98.

194. *Ardea herodias* Linn.—Great Blue Heron. Not abundant. May 21, '99. Usually observed in August and September.

201. *Ardea virescens* (Linn.)—Green Heron. An abundant summer resident and breeder. Arrives May 1 to 10; breeds May 20 to Aug. 1; leaves Sept. 15 to 30.

202. *Nycticorax nycticorax nævius* (Bodd.)—Black-crowned Night Heron. Summer resident, common. Arrives Apr. 15 to May 1; breeds May 20 to June 15; leaves Sept. 20 to Oct. 10.

204. *Grus americana* (Linn.)—Whooping Crane. A rather common migrant. Mar. 20 to Apr. 1; Oct. 15 to 30.

205. *Grus canadensis* (Linn.)—Little Brown Crane. Very rare. One killed in May, '95.

206. *Grus mexicana* (Müll.)—Sandhill Crane. Migratory, common. Mar. 25 to Apr. 10; Oct. 1 to 20.

212. *Rallus virginianus* Linn. Virginia Rail. Common migrant and summer resident. Arrives May 1 to 10; breeds May 15 to 25; leaves Sept. 25 to Oct. 15.

214. *Porzana carolina* (Linn.)—Sora. More plentiful than the preceding species. Migration and breeding dates the same.

221. *Fulica americana* Gmel.—American Coot. Common summer resident. Arrives Apr. 1 to 15; breeds May 25 to June 15; leaves Sept. 20 to Oct. 10.

224. *Steganopus tricolor* (Vieill.)—Wilson's Phalarope. Migratory, common. Arrives Apr. 20 to May 1. Not noted in autumn.

228. *Philohela minor* (Gmel.)—American Woodcock. A few killed years ago on the Clearwater, ten miles west of Neligh.

230. *Gallinago delicata* (Ord)—Wilson's Snipe. Common migrant. Apr. 10 to May 1; Sept. 25 to Nov. 15. A few remain throughout the winter, along spring creeks.

231. *Macrorhamphus griseus* (Gmel.)—Dowitcher. A large flock, May 16, '99.

232. *Macrorhamphus scolopaceus* (Say)—Long-billed Dowitcher. A few in company with the preceding, May 16, '99.

233. *Micropalama himantopus* (Bonap.)—Stilt Sandpiper. One taken May 10, '99.

239. *Tringa maculata* Vieill.—Pectoral Sandpiper. Migratory, common, Apr. 15 to May 1; August 15 to Sept. 1.

240. *Tringa fuscicollis* Vieill.—White-rumped Sandpiper. Rather common migrant, May 1 to 15. Not observed in autumn.

241. *Tringa bairdii* (Coues)—Baird's Sandpiper. A common migrant, usually seen in company with the Least Sandpiper. Apr. 20 to May 15; Aug. 15 to Sept. 1.

242. *Tringa minutilla* Vieill.—Least Sandpiper. Abundant during migrations. Apr. 30 to May 15; Aug. 15 to Sept. 10.

246. *Ereunetes pusillus* (Linn.)—Semipalmated Sandpiper. Common migrant in company with the preceding species.

254. *Totanus melanoleucus* (Gmel.)—Greater Yellow-legs. Somewhat common during migration. Apr. 20 to May 10; Aug. 15 to Sept. 20.

255. *Totanus flavipes* (Gmel.)—Yellow-legs. An abundant migrant. Same dates as last.

256. *Helodromas solitarius* (Wils.)—Solitary Sandpiper. Common migrant and summer resident, Apr. 20 to May 10; Sept. 1 to 20.

258a. *Symphemia semipalmata inornata* Brewst.—Western Willet. Several seen early in May, '99.

261. *Bartramia longicauda* (Bechst.)—Bartramian Sandpiper. Summer resident, common. Apr. 25 to May 10; Aug. 1 to Sept. 15.

262. *Tringites subruficollis* (Vieill.)—Buff-breasted Sandpiper. Rare migrant, a small flock seen Aug. 12, '99.

263. *Actitis macularia* (Linn.)—Spotted Sandpiper. Common summer resident. Apr. 20 to May 10; Sept. 1 to 20.

264. *Numenius longirostris* Wils.—Long-billed Curlew. Formerly common, now somewhat rare. Arrives May 5 to 15.

270. *Squatarola squatarola* (Linn.)—Black-bellied Plover. Small flock in April, '98.

272. *Charadrius dominicus* Müll.—Golden Plover. Rare migrant. Several killed in April and October, '98.

273. *Ægialitis vocifera* (Linn.)—Kildeer. An abundant summer resident and breeder. Arrives Mar. 1 to 15; breeds in May and leaves Oct. 1 to 15.

274. *Ægialitis semipalmata* Bonap.—Semipalmated Plover. Migratory, not common. Arrives in latter part of April. Not noted in fall.

289. *Colinus virginianus* (Linn.)—Bob-white. Resident, common. Breeds from May until September.

305. *Tympanuchus americanus* (Reich.)—Prairie Hen. Resident, common. Breeds from latter part of May until August.

308b. *Pediœcetes phasianellus campestris* Ridgw.—Prairie Sharp-tailed Grouse. Formerly abundant, now rare. One killed in the fall of '98.

316. *Zenaidura macroura* (Linn.)—Mourning Dove. Summer resident, abundant. Arrives Apr. 1 to 10; breeds from last of April until September; leaves Oct. 10 to Nov. 1.

325. *Cathartes aura* (Linn.)—Turkey Vulture. Somewhat rare; usually observed about the first of May, and in latter part of September.

331. *Circus hudsonius* (Linn.)—Marsh Hawk. An abundant resident, breeding late in May.

332. *Accipiter velox* (Wils.) -Sharp-shinned Hawk. Common in fall, winter and spring.

333. *Accipiter cooperii* (Bonap.)—Cooper's Hawk. Somewhat rare. Several seen in fall of '99.

334. *Accipiter atricapillus* (Wils.)—American Goshawk. Somewhat common as a winter resident.

337. *Buteo borealis* (Gmel.) -Red-tailed Hawk. Not common. Several seen Oct. 6, '99.

339. *Buteo lineatus* (Gmel.)—Red-shouldered Hawk. Rare. Oct. 6, '98.

342. *Buteo swainsoni* Bonap.—Swainson's Hawk. Migratory, common; summer resident, rare. Saw an immense flock of these hawks on their southward migration Aug. 28, '99. [Cf. *Auk* XVI, Oct., '99; pp. 352-353].

347a. *Archibuteo lagopus sancti-johannis* (Gmel.)—American Rough-legged Hawk. Rather abundant in fall, winter and spring.

348. *Archibuteo ferrugineus* (Licht.)—Ferruginous Rough-leg. Rare. One found dead in the brush along the Elkhorn, where it had been left by some hunter, Dec. 25, '99.

349. *Aquila chrysætos* (Linn.)—Golden Eagle. Rare. One shot Mar. 11, '97. Another seen during November and December, '98.

352. *Haliæetus leucocephalus* (Linn.)—Bald Eagle. Rarely seen.

356. *Falco peregrinus anatum* (Bonap.)—Duck Hawk. Very rare. One shot in the spring of '96.

357. *Falco columbarius* Linn. -Pigeon Hawk. Common in fall, winter and spring. Apr. 27, '98; Sept. 28, '99.

360. *Falco sparverius* Linn.—American Sparrow Hawk. Abundant in late spring and early fall.

364. *Pandion haliætus carolinensis* (Gmel.)—American Osprey. Rather common in early May and September.

365. *Strix pratincola* Bonap.—American Barn Owl. Not uncommon.

366. *Asio wilsonianus* (Less.)—American Long-eared Owl. Common resident. Breeds late in March and early in April.

367. *Asio accipitrinus* (Pall.)—Short-eared Owl. A somewhat common resident, more often seen in late fall.

372. *Nyctala acadica* (Gmel.)—Saw-whet Owl. Winter resident, somewhat common.

373. *Megascops asio* (Linn.)—Screech Owl. Resident, not common. Breeds in April.

375. *Bubo virginianus* (Gmel.)—Great Horned Owl. Somewhat rare. Seen only in winter.

375a. *Bubo virginianus arcticus* (Swains.)—Western Horned Owl. Very rare. One seen Apr. 8, '99.

376. *Nyctea nyctea* (Linn.)—Snowy Owl. After heavy snowstorms in winter.

378. *Speotyto cunicularia hypogæa* (Bonap.)—Burrowing Owl. An abundant resident. Breeds in April and May.

387. *Coccyzus americanus* (Linn.)—Yellow-billed Cuckoo. Common summer resident. Arrives May 10 to 20; breeds June 1 to 10; leaves Sept. 1 to 10.

388. *Coccyzus erythrophthalmus* (Wils.)—Black-billed Cuckoo. Not so common as last. Migration dates the same, but breeds June 6 to July 4.

390. *Ceryle alcyon* (Linn.)—Kingfisher. Summer resident, common. Arrives Apr. 1 to 10; breeds June 1 to 20. Frequently observed in winter.

393. *Dryobates villosus* (Linn.)—Hairy Woodpecker. An abundant resident. Breeds May 5 to 20.

394c. *Dryobates pubescens medianus* (Swains.)—Downy Woodpecker. Resident, common. Breeding dates same as last.

406. *Melanerpes erythrocephalus* (Linn.) Red-headed Woodpecker. Common summer resident and breeder.

412a. *Colaptes auratus luteus* Bangs—Northern Flicker. Resident, common. Breeds May 1 to 20.

413. *Colaptes cafer* (Gmel.)—Red-shafted Flicker. Not so plentiful as preceding. Seen in summer, and doubtless breeds here.

417. *Antrostomus vociferus* (Wils.)—Whippoorwill. Summer resident, not common. Breeds May 15 to June 1.

420. *Chordeiles virginianus* (Gmel.)—Nighthawk. Abundant summer resident. Arrives May 10 to 20; breeds early in June; leaves Sept. 1 to 10.

423. *Chætura pelagica* (Linn.)—Chimney Swift. Rare. Several seen Apr. 30, '99.

444. *Tyrannus tyrannus* (Linn.)—Kingbird. An abundant summer resident. Arrives May 1 to 10; breeds throughout June; leaves Sept. 1 to 10.

447. *Tyrannus verticalis* Say—Arkansas Kingbird. Not uncommon as a migrant, but rare as a summer resident. May 5 to 20; Sept. 10 to 20.

456. *Sayornis phœbe* (Lath.)—Phœbe. A somewhat irregular summer resident. Arrives Apr. 10 to 20; breeds Apr. 20 to May 5 (1st brood); July 1 to 15 (2nd brood). Not noted later than August.

466. *Empidonax traillii* (Aud.)—Traill's Flycatcher. Migratory, common. Probably a summer resident. May 5 to 20; Aug. 10 to Sept. 1.

467. *Empidonax minimus* Baird—Least Flycatcher. Rather common migrant, May 10 to 20. Not noted in autumn.

474b. *Otocoris alpestris praticola* Hensh.—Prairie Horned Lark. Resident, abundant. Raises two broods, the first in March or early April, and the second in June.

477. *Cyanocitta cristata* (Linn.)—Blue Jay. Summer resident, very abundant. Arrives Apr. 20 to May 1; breeds May 5 to 20; leaves Sept. 20 to Oct. 10.

488. *Corvus americanus* Aud. American Crow. Resident, common. Breeds Apr. 1 to 15 (1st brood); May 30 to June 15 (2nd brood).

494. *Dolichonyx oryzivorus* (Linn.)—Bobolink. Common summer resident. Arrives May 1 to 10; breeds May 20 to June 10; leaves Sept. 10 to 20.

495. *Molothrus ater* (Bodd.)—Cowbird. Summer resident, abundant, breeding throughout the summer.

497. *Xanthocephalus xanthocephalus* (Bonap.)—Yellow-headed Blackbird. An abundant summer resident. Arrives Apr. 10 to 20; breeds early in May; leaves Oct. 5 to 30. I saw one individual Nov. 26, '99.

498. *Agelaius phœniceus* (Linn.)—Red-winged Blackbird. An abundant migrant and summer resident. Arrives Mar. 5 to 20; breeds May 10 to July 15. Usually leaves Oct. 10 to 20, but was common until Nov. 25 the present year.

501. *Sturnella magna* (Linn.)—Meadow Lark. Somewhat rare summer resident. Arrives Mar. 5 to 20; breeds May 1 to July 15; leaves Oct. 10 to 30.

501b. *Sturnella magna neglecta* (Aud.)—Western Meadow Lark. An abundant migrant and summer resident. Same dates as last.

506. *Icterus spurius* (Linn.)—Orchard Oriole. Summer resident, common. Arrives May 5 to 15; breeds June 5 to 20; leaves Sept. 1 to 10.

507. *Icterus galbula* (Linn.)—Baltimore Oriole. An abundant summer resident. Arrives May 5 to 17; breeds June 1 to 15; leaves Sept. 5 to 15.

509. *Scolecophagus carolinus* (Müll.)—Rusty Blackbird. An abundant migrant, and not uncommon winter resident. Oct. 1 to Apr. 15.

510. *Scolecophagus cyanocephalus* (Wagl.)—Brewer's Blackbird. Not as common as preceding species. Same dates of migration, but not noted in winter.

511b. *Quiscalus quiscula æneus* (Ridgw.)—Bronzed Grackle. Summer resident, abundant. Arrives Mar. 25 to Apr. 10; breeds May 1 to 15; leaves Oct. 1 to 15. This year remained a month longer, until Nov. 20.

515. *Pinicola enucleator canadensis* (Cab.)—Pine Grosbeak. Two seen and one shot Nov. 22, '98.

517. *Carpodacus purpureus* (Gmel.)—Purple Finch. Somewhat irregular migrant. Oct. 16, '98; Oct. 20 to 25, '99. Not noted in spring.

521. *Loxia curvirostra minor* (Brehm)—American Crossbill. Irregular migrant and winter resident, not common. Several seen as early as Aug. 29, '98.

521a. *Loxia curvirostra stricklandi* Ridgw.—Mexican Crossbill. Rare straggler. I shot a female Dec. 9, '98.

528. *Acanthis linaria* (Linn.)—Redpoll. Very irregular winter resident, November to April. Some years entirely absent.

529. *Astragalinus tristis* (Linn.)—American Goldfinch. Abundant resident. Breeds July 10 to Aug. 20.

533. *Spinus pinus* (Wils.)—Pine Siskin. A common but irregular migrant and winter resident.

534. *Passerina nivalis* (Linn.)—Snowflake. A small flock Mar. 16, '99.

536. *Calcarius lapponicus* (Linn.)—Lapland Longspur. Abundant winter resident. Oct. 15 to Apr. 1.

538. *Calcarius ornatus* (Towns.)—Chestnut-collared Longspur. Migratory, common. Apr. 10 to 25; Oct. 1 to 15. One individual seen Aug. 12, '99, and several early in September.

540. *Pooecetes gramineus* (Gmel.)—Vesper Sparrow. Common migrant and summer resident. Apr. 10 to 25; Oct. 15 to 30.

542a. *Ammodramus sandwichensis savanna* (Wils.)—Savanna Sparrow. Migratory, common; probably a summer resident. Apr. 20 to May 1; Oct. 1 to 10.

542b. *Ammodramus sandwichensis alaudinus* (Bonap.)—Western Savanna Sparrow. I took one in October, '99.

546. *Ammodramus savannarum passerinus* (Wils.)—Grasshopper Sparrow. Summer resident, abundant. Arrives May 1 to 10; leaves Sept. 30 to Oct. 10.

548. *Ammodramus leconteii* (Aud.)—Leconte's Sparrow. Rare migrant. One taken Apr. 15, '99.

552. *Chondestes grammacus* (Say)—Lark Sparrow. Common summer resident.

553. *Zonotrichia querula* (Nutt.)—Harris's Sparrow. Migratory, common; winter resident, rare. May 1 to 15; Sept. 20 to Nov. 1. A small flock remained throughout the severe winter of '98–'99.

554. *Zonotrichia leucophrys* (Forst.)—White-crowned Sparrow. Common migrant. Apr. 25 to May 10; Sept. 22 to Nov. 1.

554a. *Zonotrichia leucophrys intermedia* Ridgw.—Intermediate Sparrow. Not quite so common as last. Same dates of migration.

558. *Zonotrichia albicollis* (Gmel.)—White-throated Sparrow. Abundant migrant. Apr. 15 to May 10; Sept. 18 to Nov. 1.

559. *Spizella monticola* (Gmel.)—Tree Sparrow. Winter resident, abundant. Oct. 5 to Apr. 12.

560. *Spizella socialis* (Wils.)—Chipping Sparrow. Migratory, common. Summer resident, rare. May 5 to 15; Sept. 1 to 20.

561. *Spizella pallida* (Swains.)—Clay-colored Sparrow. An abundant migrant. Same dates as last.

563. *Spizella pusilla* (Wils.)—Field Sparrow. Summer resident, common. Arrives Apr. 18 to May 1; breeds in latter part of May; leaves Sept. 25 to Oct. 10.

567. *Junco hyemalis* (Linn.)—Junco. Migratory, common, but somewhat rare in the winter months. Arrives from the north the first of October, and leaves in April.

567a. *Junco hyemalis oregonus* (Towns.)—Oregon Junco. Rare. One

seen Oct. 16, '98, and a few more later in the month.

581. *Melospiza fasciata* (Gmel.)—Song Sparrow. Migratory, common; summer resident, rare. Apr. 5 to 30; Sept. 1 to Nov. 1. Rarely observed in winter.

583. *Melospiza lincolnii* (Aud.)—Lincoln's Sparrow. Migratory, common. Apr. 20 to May 6; Sept. 15 to Oct. 20. One individual of this species remained throughout the winter of '98-'99.

584. *Melospiza georgiana* (Lath.)—Swamp Sparrow. Common migrant and summer resident. Arrives early in May; breeds June 1 to 10; leaves last of September.

585. *Passerella iliaca* (Merrem)—Fox Sparrow. Migratory, frequent. Arrives in April and leaves Oct. 3 to Nov. 15.

587. *Pipilo erythrophthalmus* (Linn.)—Towhee. Common migrant and summer resident. Arrives Apr. 10 to 20; breeds late in May; leaves Sept. 20 to Nov. 3. Several seen Nov. 22, '98.

595. *Zamelodia ludoviciana* (Linn.)—Rose-breasted Grosbeak. Summer resident, common. Arrives May 4 to 12; breeds early in June; leaves Sept. 8 to 26.

596. *Zamelodia melanocephala* (Swains.)—Black-headed Grosbeak. Rare. May 9, '98. Also several seen early in September, '98.

598. *Cyanospiza cyanea* (Linn.)—Indigo Bunting. Summer resident, not common. May 30 to Sept. 1.

604. *Spiza americana* (Gmel.) Dickcissel. Summer resident, abundant. Arrives May 15 to 25; breeds early in June; leaves Aug. 20 to Sept. 5.

605. *Calamospiza melanocorys* Stejn.—Lark Bunting. Common summer resident. Same dates as preceding species.

608. *Piranga erythromelas* Vieill.—Scarlet Tanager. Summer resident, rare. May 10, '99.

611. *Progne subis* (Linn.)—Purple Martin. Abundant summer resident. Apr. 15 to Sept. 1.

612. *Petrochelidon lunifrons* (Say)—Cliff Swallow. Summer resident, irregular.

613. *Hirundo erythrogastra* Bodd.—Barn Swallow. Common summer resident. Arrives Apr. 19 to May 1; breeds in May and June; leaves Sept. 20 to Oct. 10.

614. *Tachycineta bicolor* (Vieill.)—Tree Swallow. Migratory, common; summer resident, rare. Arrives May 1 to 10; breeds in latter part of May. Not noted in fall.

616. *Clivicola riparia* (Linn.)—Bank Martin. Summer resident, very common. Arrives Apr. 12 to 25; breeds in May; leaves late in September.

617. *Stelgidopteryx serripennis* (Aud.)—Rough-winged Swallow. Not common. I found a nest with three fresh eggs July 3, '97, under the Elkhorn bridge at Neligh.

618. *Ampelis garrulus* Linn.—Bohemian Waxwing. Irregular winter visitor. I saw several small flocks Feb. 1, '98, which remained until latter part of March.

619. *Ampelis cedrorum* (Vieill.)—Cedar Waxwing. Migratory, not common. Arrives in May and leaves Oct. 10 to 20.

621. *Lanius borealis* Vieill.—Northern Shrike. Winter resident, common. Oct. 24 to Apr. 1.

622a. *Lanius ludovicianus excubitorides* (Swains.)—White-rumped Shrike. A somewhat rare summer resident. Breeds late in June.

624. *Vireo olivaceus* (Linn.)—Red-eyed Vireo. Common summer resident. Arrives May 1 to 10; breeds May 25 to July 1. Leaves Sept. 1 to 10.

627. *Vireo gilvus* (Vieill.)—Warbling Vireo. Migratory, not common. Same dates as preceding species.

633. *Vireo bellii* Aud.—Bell's Vireo. Summer resident, abundant. May 23 to Sept. 9. Breeds last of May.

636. *Mniotilta varia* (Linn.)—Black and White Warbler. Common

during migrations. Apr. 28 to May 10; Aug. 26 to Sept. 8.

646. *Helminthophila celata* (Say)—Orange-crowned Warbler. An abundant migrant. May 2 to 12; Sept. 18 to Oct. 15.

652. *Dendroica æstiva* (Gmel.)—Yellow Warbler. Our most abundant warbler. Arrives May 1 to 10; breeds last of May and all of June; leaves Aug. 20 to Sept. 5.

655. *Dendroica coronata* (Linn.)—Yellow-rumped Warbler. Migratory, abundant. Apr. 25 to May 12; Oct. 4 to 15.

657. *Dendroica maculosa* (Gmel.)—Magnolia Warbler. Present in fair numbers during migrations. May 16 to 22. Not observed in autumn.

658. *Dendroica rara* Wils.—Cerulean Warbler. Rare. A female, May 17, '99.

661. *Dendroica striata* (Forst.)—Black-poll Warbler. Common migrant. May 5 to 24.

667. *Dendroica virens* (Gmel.)—Black-throated Green Warbler. Rare. Late in April, '98, and May 4, '99.

674. *Seiurus aurocapillus* (Linn.)—Oven-bird. Common migrant. May 5 to 15; Sept. 1 to 10.

675a. *Seiurus noveboracensis notabilis* (Ridgw.)—Grinnell's Water-Thrush. Rare migrant. May 16, '99.

679. *Geothlypis philadelphia* (Wils.)—Mourning Warbler. Migratory, not uncommon. May 16 to 24, '99.

681. *Geothlypis trichas* (Linn.)—Maryland Yellow-throat. Common migrant and summer resident. Apr. 29 to Oct. 1.

683. *Icteria virens* (Linn.)—Yellow-breasted Chat. Migratory, common; summer resident, rare. May 17 to Sept. 10.

685. *Wilsonia pusilla* (Wils.)—Wilson's Warbler. A somewhat common migrant. Apr. 28 to May 13. Also Sept. 2, '99.

687. *Setophaga ruticilla* (Linn.)—American Redstart. An abundant migrant, and probably a summer resident. May 10 to 20; Aug. 30 to Sept. 8.

697. *Anthus pensilvanicus* (Lath.)—American Pipit. Migratory, common. Arrives in April and leaves in October.

704. *Galeoscoptes carolinensis* (Linn.)—Catbird. An abundant summer resident. Arrives May 7 to 20; breeds in June; leaves Sept. 10 to 25.

705. *Harporhynchus rufus* (Linn.)—Brown Thrasher. Very common summer resident. Arrives Apr. 25 to May 4; breeds last of May and in June; leaves Sept. 15 to 30.

715. *Salpinctes obsoletus* (Say)—Rock Wren. Migratory, rare. Latter part of April, '97.

721. *Troglodytes ædon* Vieill.—House Wren. Summer resident, abundant. Arrives May 11 to 17; breeds in June; leaves Sept. 1 to 10.

722. *Anorthura hiemalis* (Vieill.)—Winter Wren. Rare. Sept. 15, '98.

725. *Cistothorus palustris* (Wils.)—Long-billed Marsh Wren. Somewhat common as a migrant, and probably a summer resident. Arrives late in April, and leaves Sept. 15 to 30.

726. *Certhia familiaris fusca* (Barton)—Brown Creeper. Migratory, common; winter resident, rare. Arrives Apr. 1 to 15; leaves in October.

727. *Sitta carolinensis* Lath.—White-breasted Nuthatch. Somewhat common as a winter resident, October to April.

728. *Sitta canadensis* Linn. Red-bellied Nuthatch. Migratory, somewhat rare. Sept. 15, '98; Sept. 25, '99.

731. *Parus bicolor* Linn.—Tufted Titmouse. Rare. Apr. 22, '99.

735. *Parus atricapillus* Linn.—Chickadee. Resident, common. Breeds in April.

735a. *Parus atricapillus septentrionalis* (Harris) Long-tailed Chickadee. More plentiful than preceding.

748. *Regulus satrapa* Licht.—Golden-crowned Kinglet. Migratory, rare. Oct. 16, '98.

749. *Regulus calendula* (Linn.)—Ruby-crowned Kinglet. Fairly com-

mon during migrations, but somewhat irregular. Apr. 1 to 20; Oct. 1 to 15.

751. *Polioptila cærulea* (Linn.)—Blue-gray Gnatcatcher. A not uncommon migrant. May 9, '98; Apr. 29, '99.

754. *Myadestes townsendii* (Aud.)—Townsend's Solitaire. Rare straggler. Feb. 16, '99.

755. *Hylocichla mustelinus* (Gmel.)—Wood Thrush. Summer resident, common. Arrives May 4 to 15; breeds in June; leaves early in September.

758a. *Hylocichla ustulata swainsoni* (Caban.)—Olive-backed Thrush. Common migrant. May 1 to 20; Sept. 10 to 20.

761. *Merula migratoria* (Linn.)—American Robin. Common in spring, summer and fall. A few remain throughout the winter, feeding about open springs. The main body arrives from the south early in March, and leaves in October and November. Breeds in April.

766. *Sialia sialis* (Linn.)—Bluebird. An irregular summer resident. Arrives in April; breeds from May to July; leaves in September and October.

SOME NOTES ON THE NESTING OF THE RAPTORES OF OTOE COUNTY, NEBRASKA.

MR. M. A. CARRIKER, JR.

The contents of this paper are taken from observations made by myself during the past four years, and nothing is entered of which I entertain the least doubt as to its accuracy, unless special mention is made of the fact.

The most of my observations were made in the eastern part of the county, along the Missouri River and the small streams and creeks running into it. This section was formerly covered with a heavy growth of timber, and is so still in many places, affording excellent places of concealment and breeding sites for the numerous Raptores common to this section of the country. Here also can be found in abundance the small mammals on which they depend for food for themselves and their young.

The Raptores which, to my knowledge, breed here, are: Turkey Vulture, Red-tailed Hawk, Red-shouldered Hawk, Cooper's Hawk, Sparrow Hawk, Saw-whet Owl, Screech Owl, Long-eared Owl, Barred Owl and Great Horned Owl.

In addition to the above I have taken the following species, which are merely migrants here: American Rough-legged Hawk, Marsh Hawk, Swainson's Hawk, Sharp-shinned Hawk, Short-eared Owl and Barn Owl. The Marsh Hawk was secured in November, and remained, I think, on account of the abundance of food; for the locality in which it was secured abounded in field mice, which it had been eating. The Rough-legged, Swainson's and Sharp-shinned Hawks were secured in the latter part of March, and were probably migrating. I secured a male and female Short-eared Owl December 21, 1897, from a flock of seven. They were in a large tract of hay-land, intersected with grass-grown hollows, which gave them refuge during the daytime. I could find no trace of them the next spring or summer, and came to the conclusion that they were congregated there

in the winter, on account of the abundance of food, as is frequently the case with this species.

The Turkey Vulture is very common, especially along the river, where, standing on one of the high bluffs on a summer day, it is rarely the case that one cannot see from one to a dozen, sailing lazily along, following the course of the river in their search for food. The nesting begins about the last week in May, when one or two eggs are deposited; generally two. The site is a hollow tree or stump or beside some decayed log in the thick timber, and I have never found them breeding farther from the river than the wooded bluffs which skirt its banks. One nest was found in the hollow top of an immense linden tree, and every attempt to flush the bird from the cavity was unsuccessful until a lighted paper was dropped into it, which ignited her tail feathers, and brought about a hasty and undignified departure, leaving the two beautifully marked eggs to be secured.

The most common hawks are the Red-tailed and Cooper's, both breeding quite extensively in all parts of the county, but more abundantly along the river.

The Red-shouldered and Sparrow Hawks are less abundant, the Red-shouldered being quite rare, as I have never found it breeding but once, when I located a pair on a heavily timbered creek twelve miles south of Nebraska City, known as Camp Creek. The nest was placed among the larger limbs of a cottonwood tree growing near the creek, and towering up to the tops of the trees growing on the top of the high banks. As near as I could estimate, it was about 60 feet from the ground. On April 11, 1899, I secured two fresh eggs from the nest, which was a very loosely built structure of large twigs, lined with bark. The eggs were brownish white, heavily washed and blotched with light brown and lilac.

Sparrow Hawks are very abundant in the early spring, but many pass on north to their breeding grounds, leaving fewer to breed here than would be expected from their early abundance. The only nest observed was found May 7, 1898. It was located in an old cavity, probably made by a Flicker. The cavity was in a cottonwood stub about twelve feet from the ground, and from its appearance had been used several years by the Sparrow Hawk. It was near an old, unoccupied house, standing alone upon a hilltop almost bare of trees. The nest was composed of grass, feathers and other rubbish and contained five fresh eggs, from which the female had to be removed by force, and at the expense of not a few scratches. The Sparrow Hawk generally frequents some small isolated grove or a small creek with trees along its banks. Their principal food is mice and grasshoppers. I think it must have been the abundance of mice around the old house which caused the above-mentioned pair to take up their abode there, because there was a wooded creek less than a quarter of a mile from the place. They begin to arrive in March, and are nearly all gone by the first of November.

The Cooper's Hawk is by far the most abundant of our hawks, and seems to have the worst reputation among the farmers. It is merely a summer resident, arriving in March and departing at the first cold snap in the fall. It is the boldest and most fearless of our species, nearly always

nesting in some grove or on some creek not far from a farm house. Its food consists mainly of chickens, mice, gophers, young squirrels, and other rodents, while once I caught one in the very act of eating a quail which it had captured from a flock hiding under a vine-covered tree, the marks of the struggle showing plainly on the light snow, fallen the night before. The nesting dates run from the 26th of April to the 17th of May, for fresh eggs of first sets. Second and even third sets will be deposited in case the first and second are taken. The nests are almost invariably placed in a thick bunch of trees and from fifteen to forty feet from the ground, and are generally about the size of a Crow's nest, but are constructed entirely of small twigs, with a nearly flat top and a scanty lining of bark or leaves. The number of eggs to the set varies from three to five, generally four. The coloration is generally a buffy-white background, though often with a bluish tinge, with scanty markings of light chestnut and lilac. Rarely a set will be found with one or more of the eggs beautifully marked.

But of all our hawks, the most interesting to me is the Red-tailed Hawk (*Buteo borealis*). It is the largest of our species, and in its habits much resembles its larger relative the eagle, as perched on the top of some scarred old giant of the forest it watches in haughty silence for its luckless quarry, or soaring overhead, its eye sweeps the ground in search of food; or when, seeking to protect its nest from the plundering oologist, it rushes savagely at the unwonted shape ascending the tree, while its hoarse screams echo over the treetops. It frequents more than any other place the wooded bluffs overlooking the river, and often its nest is built in the tallest and most conspicuous tree on the side of such a bluff, facing the river, as if it loved the grandeur of the scene and wished to instill into its offspring the same spirit. More often, though, the nest will be found just over the ridge from its eyrie, or in some giant cottonwood growing out of a cleft in the hills. Whatever the situation, however, it is always placed above the tops of the surrounding trees, and thus is easy to find; for, if one is certain that it is in the vicinity, all he needs to do is to select the highest point of view and carefully scan the surrounding country with a field glass until he sees it. This hawk generally stays the year round in the same locality, and if not disturbed too often, will build its nest year after year in the same tree, by either adding to the old structure, or constructing a new one, while if disturbed, merely choosing the nearest suitable tree. The nest in some cases, thus becoming a huge affair, is easily seen from a distance. It is always a large, compact, well-made structure. I can recall no instance of the finding of the eggs of a Red-tailed Hawk in a flimsy or poorly-made nest.

The nesting nearly always begins in the latter part of March and fresh eggs may generally be found from March 25th to April 10th. The number of eggs runs from two to four, averaging three. I myself have never found a larger set than three, but saw a set of four collected by another party. If the first set is taken a second set will nearly always be deposited, sometimes in the same nest, but more often in a new nest not far from the first. Second sets almost invariably contain two eggs; I know of but one case where three were laid. The eggs are buffy white, or with a bluish tinge,

blotched and spotted with bright chestnut and rufous. The markings vary much in different eggs; some eggs may be almost immaculate, while others are blotched over the whole surface, presenting a beautiful appearance. I could give many more interesting facts concerning the habits of this majestic bird, but the time will not allow me to do so.

We will now consider the other branch of the Raptores, the Striges, or Owls.

On but two occasions have I ever seen our smallest owl, the Saw-whet Owl, and have never been able to collect any of their eggs myself, but was told of a set of five collected near Nebraska City about seven years ago, by Messrs. N. H. Reed and H. E. Hershey of that place.

The Screech Owl is much more plentiful, there being hardly a creek or patch of timber without one or more of these interesting little owls. They seem to like cottonwood groves, where they take up their residence in a deserted Flicker's hole. I have frequently taken eggs from such positions. The red variety is not as common as the gray. Like the majority of the owls, the Screech Owl does not migrate, but remains in the same place the year round, and if not disturbed too often will lay in the same hole year after year. Its food consists almost exclusively of mice of various kinds and ground squirrels. I have never found the bones or skull of a bird in the pellets of a Screech Owl, or in fact of any other owl. The best way to find one of them in the summer is to go along a creek or through a grove where there are trees overgrown with grape vines, when, by shaking these vines, it will not be long till one will be flushed. They do not resort to the holes much until cold weather or in the breeding season. Eggs are deposited from the 20th of April to the 12th of May. However, it is very uncertain when they will lay. One year I found a set of six badly incubated eggs on April 21st, and again have taken fresh eggs on May 7th. The average number of eggs is five. The nest is made of leaves and grass, lined with feathers pulled from the breast of the female. On one occasion I took from her nest a female, which had pulled the feathers from her breast until it was almost bare.

The Long-eared Owl was very plentiful eight or ten years ago, but is quite rare now. At present I know of but one pair, which lives in a tangled patch of timber growing on the river bottom about four miles southeast of Nebraska City. Two years ago there was another pair on a small creek, but they have disappeared. I know very little of the habits of this bird, as it is shy and difficult to approach, living as it does in the dense woods, overrun with vines and creepers. I have found three nests with eggs of this species; one set of four, April 10, 1897; one, April 7, 1898; and one of five eggs April 8, 1899. The first two were fresh, but the last was badly incubated. The two first were in willow trees growing near a creek, and about thirty-five feet from the ground, the last in a small vine-covered tree. All were old crow nests fitted up with a lining of grass and feathers. On two occasions the bird did not return after being flushed, but once the female returned with the male and both fought me savagely while I was securing the eggs. With snapping mandibles and erect ear tufts they had little resemblance to a bird.

The Barred Owl has been until the last year quite common. I formerly knew of six pairs within a radius of seven miles of Nebraska City on the west side of the river, but this season I was unable to locate a single nest, although I saw three pairs of birds. The reason for this was that all the old trees, containing the cavities in which they formerly bred, had been cut down and the birds compelled to seek new locations, and as I had no time to look for them they were not found.

The Barred Owl in this section always lays its eggs in a natural cavity of a tree, while the Great Horned Owl nearly always lays in open nests. Their food consists of squirrels, rabbits and other smaller rodents. The breeding commences about the middle of March unless the season is uncommonly late. On March 23d, 1897, I collected three sets in one day, all partly incubated—one set of two, one of three, and one of four eggs. The average number of eggs is three, rarely four. The nest is made by scratching up some of the rotten wood which forms the bottom of the cavity, and putting a few feathers on top of it. Sometimes there is no attempt at nest-making whatever, while again there will be quite an elaborate nest of leaves and feathers. This species, together with *Bubo virginianus*, inhabits almost exclusively the heavy timber skirting the Missouri River.

Lastly, the Great Horned Owl completes my list of the breeding Raptores of Otoe Co., Neb. This is a most interesting bird to me, because I have had occasion to observe its ways more than those of any other Owl. Until 1898 it was practically unknown to me, but on March 30, 1898, I collected my first set of their eggs. The two eggs were badly incubated, and were probably a second set, as on March 28, 1899, I found that a pair that I had robbed had a second set of two eggs. Contrary to later observations this first nest was in a very exposed position, being in a large cottonwood tree about four hundred yards from any other trees. The nest was a bulky affair, probably an old nest of *Buteo borealis* repaired somewhat and lined with grass and feathers and some bark shreds.

Feb. 18, 1899, I collected a set of three eggs from a well-built nest in a large black oak tree, growing in a ravine amongst the bluffs. The eggs were partly incubated, showing that they must have been deposited at least ten days before, making the date for laying probably Feb. 8. March 4 I secured a set of two fresh eggs from another pair, and on March 8 found a nest with two newly hatched birds, apparently about five days old. The nest contained, besides the young owls, the hind quarters of a rabbit and a full-grown rat. On April 2nd, 1898, I found two nests with nearly fledged young, one nest containing two and the other three. When I climbed to one of the nests the female attacked me so suddenly and unexpectedly as to almost make me lose my hold on the tree. I had just time to throw my gloved hand before my face when she struck it with terrific force, tearing the glove and severely lacerating my hand with her sharp claws. Before she could repeat the dose I managed to scramble up among the limbs, where I was comparatively safe from her attacks. The young in the nest were as savage as their parents, throwing their wings forward and snapping and hissing at the intruder like little demons. I took two and kept them about four months, when one escaped, and the other became so unbearably

ferocious that I was compelled to put an end to him. When young they would stand on my arm and eat from my fingers, but as they grew older they became so wild that I could not handle them with safety to myself, and then merely threw their meat in to them to be fought over. They were supplied with water all the time I had them, but I could never see that they drank a drop.

This owl is very destructive to rabbits and squirrels, as well as to rats and other small mammals. I have frequently found parts of rabbits, squirrels and rats in their nests, and in the timber where they are found small game is always conspicuous by its absence.

DISCUSSION.

MR. W. D. HUNTER called attention to the peculiar distribution of Swainson's Hawk in Nebraska. Mr. Cary notes it as rare at Neligh, and Mr. Carriker only as a migrant at Nebraska City, while here at Lincoln it is a very common summer resident. It is interesting as an illustration of the restriction of a bird whose powers of flight are remarkable, to certain localities which are particularly to its liking. He had "often seen flocks of from six hundred to a thousand passing during migrations."

MR. TROSTLER said that Mr. Dickinson of Gresham, Nebr., had reported to him that the species had never been seen there except during migrations.

PROF. BRUNER had frequently observed this hawk in considerable numbers in the western part of the state. Whenever there occurred a plague of grasshoppers in any particular locality there would also be found large numbers of this hawk, feeding upon the insects.

MR. J. S. HUNTER: "The Red-tailed Hawk seems to have quite a habit of using the same nest year after year. There is one nest a few miles from Lincoln, occupied one year by a pair, the male of which was killed. The next year the same female was found using the nest with another male. The female was shot that season and the next year the male had another mate, the nest having been used since by that pair." Certain peculiarities in plumage enabled the observers to identify the individual birds.

HOW TO POPULARIZE ORNITHOLOGY.

MR. WILSON TOUT.

Do we want to popularize Ornithology? Can our science be made popular? Would the people derive any benefits from a study of the birds, and would the birds gain or lose by such a course? These are the questions that should be considered and answered before an attempt is made to tell the how.

Not many years ago I was a boy running over the meadows and through the groves of Central Nebraska. Here I began the study of the birds, entirely of my own accord, as no one ever suggested the subject or aided me in my researches. I took the birds' eggs and made a small collection, which, as time went on, was increased until I had a large number of the eggs of our commonest forms in my collection. Unknowingly, I began to systematize my work along this line, thus laying the foundation for the work in the science which was to follow. But at what a sacrifice! Collection after collection was destroyed by accident or otherwise, and each time

with a new determination I proceeded to start in again. My lessons were valuable to me, but at such a cost to the birds. If every ornithologist were to exact such a tribute from his subject as my early experiences led me to take, bird life in Nebraska would not show a per cent gain as some of our eastern ornithologists claim to be the case.

When consciousness of my folly came to me I had no one to blame. My mother, pleased at my interest and happiness, did not remonstrate with me, as she was also unaware of the extent of the injury I was inflicting upon the birds of our vicinity.

No teacher had ever explained to me that I might learn of the birds without harming them. No bird-student lived in our town to help me and I was forced to find my own means. The desire to know of their lives led me to seek the only things available—the eggs.

While scientists were wrangling over the classification of some obscure subspecies, or spending their time and means trying to determine the exact relationships of various orders, I was endeavoring to gain a knowledge of the commonest forms by the sacrificing of more embryo lives than I can ever hope to atone for. In my own case would the birds have been benefited by a little "popular ornithology"? Could I have learned the habits of the wren, robin or swallow by the application of a little pedagogical instruction? I hold for the affirmative.

Again, why this longing on the part of our rurals for city life? Our cities are crowded with people who come there seeking what they imagine they do not have in their country homes. Do they know what they leave? I believe a popular Horticulture, a popular Geology, and a popular Ornithology would help in keeping our farmer boys contented with their lot, happy in the study of nature, and its forms and freaks. I believe there are scores of young men in Nebraska who were raised on a farm, and yet do not know the names of ten of our common birds. With them a hawk is a hawk; a duck is a duck. Good and bad are classed together and suffer the penalty of not vice, but ignorance. Would a popular Ornithology benefit this class of people?

For years our Audubon and kindred societies have been endeavoring to stop the use of birds and plumes for millinery purposes. Do they seem to succeed? They cannot secure prohibition so they are urging local option. But without education I fear the result will be as it has been so far, largely in favor of the plume hunter, and against the birds. To carry the figure farther, the innocent must suffer for the license.

I am convinced that a great duty lies before us as bird students. If we are to study birds we must have birds to study. If we are to have the birds we must give them better protection. In order to do this we must carry on a campaign of education. *Make the birds popular with the masses and their own merits will secure their safety!*

How can we popularize Ornithology? I once heard of a Catholic missionary who said; "Give me the training of a child for the first twelve years of its life and I will show you a devout Catholic at three score years and ten." His remark showed a keen insight into human nature, and rings of pedagogical soundness.

Why are teachers compelled to teach of Alcohol and Narcotics? The answer is in the priest's remark. The impression made on a child's mind is forever. Then why should we not impress the elements of ornithology on these susceptible minds when the result will be a solicitude for the welfare of our avifauna for three score years and ten. I maintain that, had my teachers understood the principles of this subject, their words would have found a ready listener, and thousands of feathered throats would now be caroling a blessing on those teachers' words for protection.

Then I would make the schools the first and greatest means of popularizing ornithology. A gentleman writing in *Recreation* once said that for every boy you interested in birds you made an egg collector. As much as to say, "Keep the boys in ignorance of the birds."

In one school I know of, ornithology is taught as a separate branch of study, every day. Now in my teaching experience I have made several hundred egg collectors---but they are Sparrow-egg collectors. In this school where ornithology is taught, from the "Busy Bees" to the graduating class, I predict that when spring comes there will be 150 more friends for the birds than there were last fall. They have in their cabinet a large number of Sparrow eggs, hundreds of nests and nearly 300 of those fine-colored plates from *Birds and All Nature*. As yet they have no mounted specimens, but it is entirely because they are unable to purchase them on account of lack of funds. Perhaps some day someone who has extra specimens will present us with a few, and so win the gratitude of a whole lot of little people who want to know more of these birds. They have named their classes, their literary societies and singing clubs after their feathered favorites. I am only citing this school as an example of what can be done through the schools. Each member of this association has it in his power to start this work in his own schools. Volunteer to help the teacher and see how quick they will be to call on you for aid.

Often editors are willing to print your own remarks on the birds of your vicinity. Under the heading "Ornithology for Farmers" much good might be done by publishing short articles on the birds of your vicinity from the economic standpoint. If you are in earnest you might visit your milliners and solicit their aid in bird protection. You may be sure your remarks will recur to them when they are picking out their fall styles. Again, for the promotion of popular ornithology the work being done by the magazine, *Birds and All Nature*, is of the right kind. While from a scientific standpoint exception might be taken, the resemblance of the plates to the subject is striking, and the low price makes them within the reach of those who cannot afford the finer works. We who are assembled could not do without our magazines of a scientific nature, but to the average person they are of passing interest or entirely beyond comprehension.

I would not seek to make of every person an ornithologist, but enough of our energies might be spared to correct the abuses of ignorance, and often superstition. Nor would I condemn all egg collecting. For those who intend to make a study of eggs a large collection is very necessary and justifiable, but for the average schoolboy to collect several hundred eggs, and then throw them aside after the fad has worn off, is equal to

wanton destruction, and should, if possible, be prevented.

Do we want to popularize Ornithology? I believe I have stated my side of the question, that we do want to popularize our science, fairly, and without prejudice. The living question for us is bird protection.

How can we secure the best results? I would say by education. Get the teachers at work, get the sportsmen interested in the observation of game laws, urge the importance of bird protection on the people, show the folly of using "stuffed" birds for head ornamentation, and a silent revolution in favor of the birds is bound to take place. Then every roadside will teem with the brood of the quail, the drowsy yeomanry will be awakened by the early matin of our friendly robin, and the thrasher, securely tipping the topmost twig of a towering tree, and shaking his little throat, will send forth a song the wild, artless harmony of which will gladden the hearts of mankind, and inspire them to nobler thoughts. Then men will bow their heads before the gush of melody bursting from every coppice and impenetrable bramble, and, looking through Nature, will see Nature's God.

DISCUSSION.

DEAN CHAS. FORDYCE: "I think the writer of this paper has referred to a practically undeveloped field. If ever we are to do much in science we must get into the common schools. Even though apparatus is not costly, and though books are not very costly, they make that a plea that they cannot touch this work. Now I believe it is true, and it has been my observation when in the schools over the state, that there is very little science work being done, except along restricted lines. In some way I believe that this Union ought to reach out and help the teachers, who are teaching most of the children of the state. The majority of our citizens are educated below the high school. In some way, either by simplifying the work that is to be given, by simplifying apparatus, or by doing both, it seems to me that we must reach out to these teachers and to these pupils."

MR. G. H. CONDRA: "I know personally of Mr. Tout's work, and thoroughly believe just what Prof. Fordyce has said. There are so many who think that if you were to mention this matter to the pupil in the public school, he would immediately become an egg collector, and that we would make scientists of them all. It is not our mission in the public school to train scientists, but to get the pupil enthusiastic, to lead him to seek for truth, and to show him something real. If the birds are referred to as living things I know you will lead the boys and girls to the love of birds, and they will not want to kill them. Mr. Tout is leading the teachers of his county to study birds in just the manner he has described.

REV. J. M. BATES: "I know I am speaking truly when I say there are many teachers who cannot tell a meadow lark. We must teach the teachers before we can expect much work done in this line."

MR. TOUT: The work I outlined in the paper is, I believe, practicable. I believe that the teacher must know more about a subject than he is able to give to his classes. I would say that I do not believe in a teacher taking up the subject of birds, or any science, and trying to teach it unless he knows something about it. I know that at the York County Institute last summer we had an inspiration. Mr. Condra was there, and the last day we had almost a bird day, and the teachers there are doing fairly satisfactory work with the knowledge they gained from that institute. The plan suggested here of teaching the teachers is the most important thing in introducing ornithology in the public schools.

Attention was called to the following outline taken from Chapman's "Bird-Life", and recommended by Prof. Bruner to the teachers of the state:

A BIRD'S BIOGRAPHY.

1.	DESCRIPTION.	Of size, form, color and markings.
2.	HAUNTS.	Upland, lowland, lakes, rivers, woods, fields, etc.
3.	MOVEMENTS.	Slow or active, hops, walks, creeps, swims, tail wagged, etc.
4.	APPEARANCE.	Alert, pensive, crest erect, tail drooped, etc.
5.	DISPOSITION.	Social, solitary, wary, unsuspicious, etc.
6.	FLIGHT.	Slow, rapid, direct, undulating, soaring, sailing, flapping, etc.
7.	SONG.	Pleasing, unattractive, continuous, short, loud, low, sung from the ground, from the perch, in the air, etc.; season of song.
8.	CALL-NOTES.	Of surprise, alarm, protest, warning, signaling, etc.
9.	SEASON.	Spring, fall, summer, winter, with times of arrival and departure, and variations in number.
10.	FOOD.	Berries, insects, seeds, etc.; how secured.
11.	MATING.	Habits during courtship.
12.	NESTING.	Choice of site, material, construction, eggs, incubation.
13.	THE YOUNG.	Food and care of, time in the nest, notes, actions, flight.

A PLEA FOR THE ENGLISH SPARROW.

MR. LAWRENCE SKOW.

At the present time a great deal is being said and written about the possibilities of destroying the so-called "Sparrow pest", and having been a careful student of birds in both this country and Europe for the past thirty years, I believe that I can speak from the standpoint of an experienced observer upon this question.

Denmark, my native country, is principally a horticultural and agricultural country, and small things are carefully considered when they have any bearing upon those industries. If the English Sparrow has done any considerable damage there it would surely be known, and means devised for their destruction, as is done in regard to all destructive birds and mammals.

One of the foremost arguments advanced against the Sparrow in this country is that, on account of their numbers, they drive out other birds and deprive them of their nesting places.

In Europe, where the English Sparrow is present in far greater numbers than anywhere in America, Starlings, European Tree Sparrows, Nuthatches, Wheatears, Titmice, Swallows, Swifts, and several other varieties of birds that use cavities as nesting sites, find plenty of locations for their nests, and abound around every farm house, living in peace with the English Sparrow as a near neighbor. In the vicinity of Omaha I have observed that not one in twenty suitable cavities in trees are occupied by birds of any kind; which shows that there is plenty of room for the Bluebirds, Martins, Wrens, Chickadees and others to breed.

During the past summer I spent a great deal of time at an orchard and vineyard near Florence, in this county. During previous years the owner of this place has killed the English Sparrows at every opportunity. His charge against them was that they nested in his wren boxes. I remonstrated with him and induced him to put up more boxes, and make the entrances of some of them too small for the sparrows, but large enough for the wrens to enter, and the result was that wrens and Sparrows were numerous around the house this year. In the dooryard one tree contained nests of Kingbird, Orchard Oriole, and Warbling Vireo; other trees near the house contained nests of Baltimore Orioles, Robins, Kingbirds, Red-eyed Vireos, Wood Pewee, Scarlet Tanager, Rose-breasted Grosbeak, and under the eaves of the buildings were nests of Phœbes and Barn Swallows. Around this place it seemed as if there were nests in every available place, and all the birds lived in peace and raised their broods of young, feeding them mostly upon insects caught in the orchard, vineyard and garden plot.

In previous years tent caterpillars were very abundant, but this year not one of their nests was to be seen around this place, although they were numerous in other portions of this county. Worm-eaten apples were very rare in this orchard this year; and while neighboring gardeners complained very much of green cabbage worms, there were very few of them found in a cabbage patch near this house.

A flock of about fifty English Sparrows have made their winter quarters around this house and frequently visit the corn crib, but the owner of the place says "they are welcome to the corn, as they have well earned it", and he vows that he will protect them in the future.

One complaint against the Sparrows is that they are such prolific breeders. This should redound to the credit of the Sparrow, as when the young are in the nest they are fed almost exclusively upon insects. Mr. W. D. Hunter of the University of Nebraska had a very interesting experience with the English Sparrow as a grasshopper destroyer upon the university campus. I will let him relate this in his own way, merely drawing your attention to it. I consider the English Sparrow to be one of the best friends that the farmer and fruit-grower has, and I have arrived at this conclusion from my experience in this country and in Europe, where they have been carefully studied for many years.

Dr. Brehm in "Bird-Life" states that Frederick the Great of Germany offered a bounty of six pfennigs (about 1½ cents) per head for English Sparrows, and everybody went Sparrow hunting. Thousands of dollars were paid out for destroying the supposed corn-robbers. The consequence of this was that the trees were soon covered with the larvæ of noxious insects, and stood not only without fruit, but also without leaves. Then it was that the great king wisely took his hand off from Nature's machinery, which he thought he could improve. He countermanded his orders regarding the destruction of the Sparrows and immediately proceeded to re-introduce the birds, undergoing great expense to secure live birds from other portions of Europe, and these were very carefully protected.

We should profit by the experience of the Germans, and not destroy this bird and then afterwards bring others back to do the work that would have been done at first, had the birds been given the opportunity.

DISCUSSION.

MR. W. D. HUNTER: "Something like four or five years ago, owing to a remarkably favorable season, a great many grasshoppers came in the fall of the year to the university campus to deposit their eggs, the campus being at that time well watered, while the surrounding gardens and lawns were not kept in such favorable condition. In consequence of this we had a terrible plague of grasshoppers the next year. About the time the first brood of Sparrows began to inspect things and feed out of the nest they discovered the insects and began devouring them. We soon noticed a great many of the birds on the campus, and as they are protected here, the small boys being kept out, it was not long before the work of extermination was carried on to such an extent that there no grasshoppers left on the campus, which was the only place in this vicinity of which this was true."

Mr. Hunter called attention to the fact that the published investigations of the Department of Agriculture referred to only 522 stomachs, taken at different times throughout the year, and represented only mature birds. He did not think the results could be taken as final.

DR. WOLCOTT: "Experience shows that assumptions in regard to an introduced species based on facts observed in its original home are likely to be misleading. I believe the English Sparrow distinctly injurious. In Michigan they do great damage to wheat, and often paths beneath rows of trees by roads adjacent to wheat fields are strewn with chaff and remnants of heads of grain. They also do much damage to fruit, pecking into grapes and peaches."

DR. WARD could conceive that the Sparrow might be of advantage in town or country, but gave one or two points with reference to its positive damage in cities. The foreigner, introduced into Troy, N. Y. about 1870, supplanted the native song-birds, fights between the two being witnessed in the streets before the latter finally disappeared. Elms, which at that time lined the streets and were so well developed that they arched over the roadway as an almost continuous avenue of shade, were, in consequence, within a few years entirely destroyed by bugs. The birds defiled public buildings and destroyed a splendid ivy which adorned one of the finest churches, and which was the pride of the whole city.

PROF. BARBOUR must go on record as an enemy of the Sparrow, but thought we ought to be careful in drawing our conclusions. In the wheat fields of Ohio and Indiana he had seen forty-acre fields about the margin of which, through a belt twenty feet wide and extending entirely around the field, one could find only here and there a kernel of wheat. After the wheat was cut the birds completely riddled the cap-sheaf, leaving no grain at all. They also destroyed growing corn by picking through the husk, and then eating the soft kernels of the ears. He knew of farmers who had abandoned the attempt to raise garden truck, owing to the injury inflicted by the birds, that pick off the sprouts as fast as they appear above ground. He called attention to the effect on architecture. It is changing the character of designs, everything in the nature of relief or carvings in stone being avoided, since that furnishes hiding places for the birds. Beautiful buildings in various parts of New England are rendered unsightly by netting and boards put up to keep away the pests. In certain cities of that region they are extremely numerous; in one storm 300 perished under the eaves of a single church, and the loss from the storm made no perceptible difference with the Sparrow population. The noise is a disagreeable feature. In certain places in Philadelphia it was difficult to talk on account of the incessant chatter.

MR. W. D. HUNTER thought that although the Sparrow did defile masonry, it more than compensated for that by destroying insects in cities where other birds would not molest them.

PROF. BARBOUR once counted the number of larvæ taken from a single elm tree in front of his window on the Yale campus in one afternoon by a Sparrow, assisted by his mate, and found it to be about 250. When the nestlings to which they were carried, and also the old birds were gorged with the food, the male continued to collect the larvæ, picking them to pieces on the flagging in front of the building. But the good thus done by the birds seems small compared with the enormous amount of injury.

DR. WARD: "There are two sides to the argument based on the destruction of insects. The destructive power of the native insectivorous birds must be deducted from the destroying capacity of the Sparrow to get the real balance of affairs."

PROF. BRUNER had some evidence against the Sparrow. The birds that the Sparrow drives out are migratory, being here only during the season when insects are available, while the Sparrow remains with us and does harm during a part of the year when the other birds would be away. The Sparrow is not insectivorous to the same degree as the birds supplanted, and is not at all a destroyer of hairy caterpillars, or insects injurious to shade trees. As a destroyer of insects in gardens, such as cabbage-worms and grasshoppers, he is near the head, but aside from a very few kinds of insects the Sparrow is not an insect-destroyer. In regions, as in that infested by the gypsy moth, where the Sparrow has driven out the cuckoos, orioles and other birds which feed on hairy caterpillars found on shade trees, it has been found necessary to resort to artificial means on a large scale to keep down the insects. He thought, had they had the opportunity, the native birds would have proven of great assistance in this task.

SUGGESTIONS AS TO AN ACCURATE AND UNIFORM METHOD OF RECORDING OBSERVATIONS.

DR. R. H. WOLCOTT.

In the author's intercourse with ornithologists in various parts of the country he has had frequent occasion to notice the variety of meanings ascribed by different persons to the words commonly used to denote the abundance of birds. In comparing lists of the birds of different states he has found it impossible to contrast, except in a very inexact manner, the relative abundance of the species treated; and in the comparison of lists of different dates the same difficulty is met with. The perusal of any state list, our own included, gives one little upon which to base an idea as to the density of the bird-population in different parts of the state, or as to the manner in which any given species is spread over the state.

Prof. Bruner's list of Nebraska birds contains thirty-four words used by different correspondents to denote the relative abundance of different species; and an examination of eight state and sectional lists furnishes, curiously, a list of words precisely the same in number, but not identical. These are partly well-chosen, partly not; some are euphonious, some very awkward; many are evidently synonymous, and used for the sake of variety; part of them are exact in significance, but most of them very indefinite in their meaning, though the conception may have been clear enough in the mind of the writer.

Terms indicative of the habit of appearance, such as *solitary* or *gregarious*, of the manner of distribution, whether *local* or *general*, and of the

time of appearance, as *residents*, *migrants*, etc., are in common use, and with pretty definite meanings. But no terms denoting number are in use, or, so far as the author can learn, have ever been proposed. With the end in view of suggesting such terms the labor of preparing this paper was begun.

First the dictionaries were searched for words with exact significance as to number, but none were found. It was evidently necessary to ascribe to the terms selected arbitrary meanings. In making this selection it seemed to the author that the following should be avoided: Awkward expressions; negative terms, as *not common*, *not rare*, etc.; terms unfamiliar in ornithological literature, as *sparing*, *few*, etc.; terms commonly associated with other ideas than that of number, as *copious*, *plentiful*, etc.; and finally the use of indices or subscripts seemed unwise as savoring of the technical, and not likely to commend itself to the majority of observers. In the eight state and sectional lists only the words *common*, *abundant* and *rare* were used by all, *occasionally* by five, and *scarce*, *frequent*, *numerous* and *uncommon* each by only two. *Common* appeared in combination with nine adjectives, *rare* with five, *numerous* with five, and *abundant* with four. At first it appeared desirable to avoid entirely the use of qualifying adjectives, but a sufficient number of good words did not seem available, so the writer fell back upon the use of the adjective *very*, which was the one most used by the authors of the lists previously mentioned.

The number of words to be employed and their significance was the most serious problem of all, and here the only aid at the command of the writer was found in the "bird horizons" published from time to time in the *Wilson Bulletin*; so that any suggestions along this line must be merely tentative, and subject to change after a practical application of the scheme here proposed. In the attempt to formulate a scheme, the mile and the square mile presented themselves naturally as the units of linear distance and area, while the numbers 1, 2, 5, 10 and 20 were decided upon as an easy series to remember, and as having an appropriate relationship to one another, so far as could be judged from the above lists. Owing to the greater abundance of birds during migration when the linear distance would be most used, while in a formal treatment of the birds of a given locality the areal unit would be employed, it seems possible to adopt the same series of numbers for both cases, applying them in a slightly different manner.

The result is embodied in the following table of meanings:

	Number observed	*Number of pairs breeding*
Very abundant:	over 21 to the mile.	over 21 to the square mile.
Abundant:	from 11 to 20 "	from 11 to 20 "
Very common:	" 6 to 10 "	" 6 to 10 "
Common:	" 3 to 5 "	" 3 to 5 "
Numerous:	" 2 "	" 2 "
Frequent:	" 1 "	" 1 "
Occasional:	1 to each 2 miles.	1 to each 2 square miles.
Infrequent:	" 3 to 5 "	" 3 to 5 "
Scarce:	" 6 to 10 "	" 6 to 10 "
Rare:	" 11 to 20 "	" 11 to 20 "
Very rare:	" 21 miles or over	" 21 miles or over.

These numbers may not allow of sufficient range and may be found not to be the most appropriate, but that must be decided experimentally.

The application of this scheme would involve the counting or the careful estimation of the birds seen, and a consideration of the distance or area covered. If the observer were recording the results of a day's trip, or of a journey of longer duration, he would divide the total number of a given species noted by the number of miles covered, without regard to whether the birds were seen in one or two large flocks or as scattered individuals, it seeming inadvisable to attempt to express this difference except by a specific statement of the fact, if for any reason it should seem desirable to do so. If the observer, on the contrary, were desirous of preparing a formal list of the birds of a given region, certain areas, as sections or quarter-sections, etc., here and there throughout the region under consideration could be selected, gone over carefully, the number of pairs of a given species breeding in the area estimated, the average of the different areas taken, and from this the number in the whole region and the abundance of the species obtained.

The use of this scheme would open up many questions now unanswered, such as those of the exact duration and intensity of migration waves and whether these culminated in a single maximum or presented several crests, the graphical method of presentation of this subject being then applicable. It would be possible to work out the exact components of avian faunæ and to present maps showing the density of bird population; while no doubt other lines of investigation would suggest themselves.

We in Nebraska possess opportunities for work exceeding those of almost any other state. The character of the surface is such that the region lends itself very readily to the application of such a scheme as the one proposed; while here is the meeting place of many of the eastern and western subspecies, and the variety of conditions is so great, that hardly any other state in the Union could present so instructive a series of maps as might be compiled for Nebraska, if the distribution of the different species were carefully worked out, for area, for limits of subspecies, and for abundance. These are the questions which should be urged upon the ornithologists of the state, these the subjects suggested to the student, and this the sort of ornithological work which should supplant the work of the mere collector.

The following words are suggested as applicable to the time of appearance of different species:

Resident:	Here throughout the year and breeds.
Summer resident:	" during the summer "
Winter resident:	" during the winter; breeding farther north.
Spring migrant:	" " spring migration.
Fall migrant:	" " fall "
Winter visitant:	" " winter for a limited period only, and only under certain favorable conditions.
Summer visitant:	" during the summer for a limited period only, and only as a wanderer.
Accidental:	presence here due to abnormal conditions and not to be again expected.
Regular (prefixed to proper words above):	Appearing every year.
Irregular " "	Not appearing every year.

Species may also be said to be generally or locally distributed, and solitary or gregarious.

Lack of time precludes a more extended discussion of the subject presented. An argument in favor of a perfectly accurate and uniform system of recording observations is not necessary—its lack must have been felt by all, and the wonder is that some scheme has not before been proposed. This paper is presented merely as a step in that direction, and with the hope that its suggestions may be applied by members of the Union, their value tested, and such modifications made as experience may show to be desirable.

PROCEEDINGS

OF THE

NEBRASKA ORNITHOLOGISTS' UNION

AT ITS

SECOND ANNUAL MEETING

Omaha, Nebr., Jan. 12, 1901

Lincoln, Nebr.
STATE JOURNAL COMPANY, Printers
October, 1901

PLATE I

A CHIMNEY SWIFT TREE

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I (Frontispiece). A Chimney Swift Tree.

II—IV. Nest of the Ruby-throated Hummingbird.

Note.—These plates, with the exception of that showing eggs, are from photographs taken September 9, when the nestling was either sixteen or seventeen days old, and about ready to leave the nest. The eggs shown in the other plate are not those involved in this history; facilities were lacking for photographing the nest successfully while it contained eggs, so other eggs of the same species were introduced later.

V—IX. Young Rose-breasted Grosbeaks.

X. A Peculiar Disease of Birds' Feet.

SECOND ANNUAL MEETING

NEBRASKA ORNITHOLOGISTS' UNION

OFFICERS

PRESIDENT.....I. S. Trostler, Omaha
VICE-PRESIDENT.....Caroline Stringer, Wayne
RECORDING SECRETARY.....E. H. Barbour, Lincoln
CORRESPONDING SECRETARY.....R. H. Wolcott, Lincoln, vice W. D. Hunter, resigned on removal from the state
EXECUTIVE COMMITTEE.....Chairman, R. H. Wolcott, Lincoln
.....J. M. Bates, Callaway
...Chas. Fordyce, University Place

ABSTRACT OF MINUTES

The second annual meeting of the Nebraska Ornithologists' Union, which convened in the lecture room of the Omaha City Library, January 12, 1901, was called to order by President Trostler at 10:45 for the morning business session.

The minutes of the previous meeting were read and approved.

The Treasurer's report was read by Lawrence Bruner, whereupon it was moved by R. H. Wolcott that it be received as read and be referred to an auditing committee to be appointed by the chair. The Corresponding Secretary then reported as follows on the results of the recent balloting for officers: President, Erwin H. Barbour, Lincoln; Vice-President, Elizabeth van Sant, Omaha; Corresponding Secretary, J. C. Crawford, Jr., West Point; Recording Secretary, R. H. Wolcott, Lincoln; Treasurer, Charles Fordyce, University Place; Executive Committee, Lawrence Bruner, Lincoln, Frank H. Shoemaker, Omaha, and I. S. Trostler, Omaha. A list of proposed members was read by the Corresponding Secretary, and on his motion all were declared unanimously elected. The Secretary announced the present membership to be 95.

On motion of R. H. Wolcott new business was introduced and desirable changes, corrections, and amendments to the Constitution were read and explained at length by him. Whereupon, by motion of J. S. Hunter, the amendments as read were adopted, the changes to appear in the revised draft of the Constitution as published in the Proceedings of the present meeting. A list of names suggested for honorary membership was read by the Secretary, and on motion of Chas. Fordyce the following, all of whom had rendered important aid to the cause of bird protection in the state, were declared unanimously elected. Ex-Gov. R. W. Furnas, Brownville; Hon. J. Sterling Morton, Nebraska City; Hon. J. C. Crawford, West Point; and Dr. Geo. L. Miller, Omaha.

As an expression of recognition by the society of the work of Mr. G. O. Shields, Editor of *Recreation*, the Committee on Resolutions was instructed to draft suitable resolutions, to be transmitted to him by the Recording Secretary before publishing in the Proceedings. In the absence of J. H. Ager, State Warden of the League of American Sportsmen and a member of the society, Lawrence Bruner reported upon an important measure for the protection of fish, game, and birds to be presented for legislative action at the present session and proposed the following resolution:

Whereas, The National League of American Sportsmen and the Nebraska State Fish and Game Protective Association,—organizations formed for the purpose of securing better protection against illegal and wanton slaughter of the fish, game, song and insectivorous birds of the state,—have prepared, with a view of presenting to the legislature, a bill designed to effect this purpose:

Therefore, we, the members of the Nebraska Ornithologists' Union, in annual meeting assembled, do unanimously approve of and endorse said bill, and request the members of the legislature to enact its provisions into law.

R. H. Wolcott suggested the names of several libraries and institutions in the state which should receive regularly the Proceedings of the society, and the matter was referred to the Executive Committee. After the reading of a careful presentation by Mr. Wolcott of the desirability of making a complete reference collection of Nebraska birds, and of storing rare and solitary specimens, notes, records, exchanges, etc., in fire-proof apartments, it was moved by Chas. Fordyce that the accumulating property of the society be stored at the University of Nebraska, in fire-proof quarters to be selected by the Recording Secretary. The following resolutions governing future permanent records proposed by R. H. Wolcott were adopted by the society:

1. That this Union recognize three kinds of records—positive, probable, and doubtful.

2. That a record be considered as positive if (*a*) based upon an actual specimen preserved, or (*b*) in the absence of an actual specimen, be based upon an observation made by an experienced observer, and concern a common species.

3. That a record be considered as probable when not based upon an actual specimen, but (*a*) be made by an experienced observer, concern a species not common but with well marked characters and the bird be clearly seen, or (*b*) be made by an inexperienced observer and concern a common and well-known species.

4. That a record be considered as doubtful when not based upon an actual specimen, and (*a*) though made by an experienced observer concern a species not common, and the bird be not seen, or (*b*) be made by an inexperienced observer and concern a bird not common and well-known.

5. That any record not based upon an actual specimen but which would otherwise be considered as positive, and which controverts existing positive records, be considered only probable until substantiated by the taking of a specimen.

6. That any record that would otherwise be considered as probable, but which controverts existing positive records be considered as doubtful until fully substantiated.

7. That the record committee be instructed to use these definitions in judging records, and that the members be requested to recognize them in the preparation of manuscript for publication.

8. That any case which in the opinion of the record committee be not fairly judged by the application of these definitions be submitted, together with the evidence, to the Union for final action, and that the individual have the right to appeal to the society from a decision of the committtee which he may consider unjust.

Lawrence Bruner reported on plans for publishing the Proceedings which met with the approval of the society, whereupon it was voted that he and the Recording Secretary be constituted a committee to confer with Hon. R. W. Furnas, Secretary of the State Board of Agriculture, relative to the matter. The meeting then adjourned till the afternoon.

During the noon recess dinner was served to the visiting members by the local members in the Commercial Club.

At 2 o'clock the meeting was again called to order for the reading of papers.

At the close, the Committee on Resolutions submitted the following report, which was approved by the society on motion of Mr. Benedict:

Resolved, by the Nebraska Ornithologists' Union, that it extend to the Library Board of Omaha its cordial thanks for the use of the lecture room of the Library Building for the annual meeting.

Resolved, That we, as members of the Nebraska Ornithologists' Union, express our keen appreciation of the courteous reception given us by the Omaha members, and also thank the press for favors received.

Resolved, That the Nebraska Ornithologists' Union express its recognition of the excellent work done by Mr. G. O. Shields, Editor of *Recreation*, in the interests of better bird and game protection; and

Be it further resolved, That the Corresponding Secretary be instructed to send him a copy of this resolution.

Resolved, That the Nebraska Ornithologists' Union assure Mr. J. H. Ager, as Game Warden of the League of American Sportsmen, of its firm support in his endeavor to procure the passage of the proposed bill for the better protection of Nebraska birds.

Resolved, That the Corresponding Secretary be instructed to present copies of these resolutions to the press.

H. M. Benedict,
J. S. Hunter,
Merritt Cary,
Committee.

The Auditing Committee, consisting of Messrs. Hunter, Fordyce, and Carriker, reported that the accounts had been examined and found correct, and upon motion of Chas. Fordyce the report was adopted and the committee discharged.

Lawrence Bruner discussed a plan by Lew Franklin, of Lincoln, for encouraging children to learn consideration and care for birds, by putting up bird houses for certain species, to which end Mr. Franklin has designed a simple, inexpensive and serviceable type of suspended nest.

The newly elected president, Erwin H. Barbour, of Lincoln, was inducted into office by the retiring president, and after a brief considera tion of minor details the meeting was declared adjourned.

Erwin H. Barbour,
Recording Secretary.

REPORT OF THE TREASURER TO JANUARY 12, 1901

RECEIPTS

46 Membership fees—Active (charter)	$46.00
16 Membership fees—Associate (charter)	8.00
4 Membership fees—Active, for 1901	4.00
6 Membership fees—Associate, for 1901	3.00
8 Annual dues—Active, for 1901	8.00
Sale of additional copies of Proceedings	10.60
Total	$79.60

EXPENDITURES

Reporting First Annual Meeting	$4.62
Stenographic work in connection with organization	2.10
Postage	6.00
Printing of Proceedings First Annual Meeting	60.00
Money order fees	.20
Balance	6.68
Total	$79.60

Lawrence Bruner,
Treasurer.

CONSTITUTION AND BY-LAWS

ARTICLE 1. (Name and Object.)

SEC. 1. This association shall be known as The Nebraska Ornithologists' Union.

SEC. 2. Its aims shall be to promote the study of ornithology by more closely uniting the students of this branch of natural history in the state of Nebraska, to encourage the study of ornithology in the schools of the state, and to foster the cause of bird protection.

ARTICLE II. (Members.)

SEC. 1 Members shall be of three classes: active, associate, and honorary.

SEC. 2. Any resident of Nebraska, not less than sixteen years of age, may become an active member on receiving a majority vote of the members present at any meeting. Only members of this class shall have the right to vote and hold office.

SEC. 3. Any person interested in ornithology may become an associate member on receiving a majority vote of those present at any meeting.

SEC. 4. Honorary members shall be elected for their eminence in ornithology or for distinguished services in furthering the aims for which this Union is established.

SEC. 5. Applications for membership in the interim between meetings may be considered by the Executive Committee, and the application granted by a unanimous vote of the committee.

SEC. 6. Any person elected a member of any class shall remain a member of that class until he present a written request to be changed to another, either to the Executive Committee or to the Union in meeting.

ARTICLE III. (Quorum.)

SEC. 1. A quorum for the transaction of business shall be one-fifth of the total active membership.

ARTICLE IV. (Officers and Committees.)

SEC. 1. The officers of this Union shall be: a President, a Vice-President, a Recording Secretary who shall also act as Librarian, a Corresponding Secretary, a Treasurer, and an Editor.

SEC. 2. There shall be an Executive Committee consisting of three members elected by the Union, with the President and Recording Secretary as ex-officio members. The chairman shall be the elective member of the committee that receives the largest number of votes.

SEC. 3. Standing Committees on Records and on Migration shall be appointed by the President with the concurrence of the Executive Committee.

ARTICLE V. (Duties of Officers and Committees.)

SEC. 1. Duties of the President. It shall be the duty of the President to preside at all of the meetings of the Union, to appoint the

standing committees provided for in Art. IV, Sec. 3, and to perform such other duties as may properly pertain to the office.

Sec. 2. Duties of the Vice-President. It shall be the duty of the Vice-President to act in the absence or incapacity of the President.

Sec. 3. Duties of the Recording Secretary. It shall be the duty of the Recording Secretary to keep a record of the meetings of the Union, to countersign all orders and documents issued by the President, to superintend the publication of the Proceedings of the Union, to act as Librarian, and to perform such other duties as properly pertain to the office.

Sec. 4. Duties of the Corresponding Secretary. It shall be the duty of the Corresponding Secretary to conduct the general correspondence of the Union, to prepare the program of the meetings, to send out the call for such meetings, and to perform such other duties as properly pertain to the office.

Sec. 5. Duties of the Treasurer. It shall be the duty of the Treasurer to receive and have charge of all moneys of the Union and to pay such bills as are endorsed by the President and Secretary.

Sec. 6. Duties of the Editor. It shall be the duty of the Editor to act with the Recording Secretary in the publication of the Proceedings.

Sec. 7. Duties of the Executive Committee. It shall be the duty of the Executive Committee to fix the date of the annual meeting, to act on applications for membership as provided in Art. II, Sec. 5, to concur in the appointment of standing committees as provided in Art. IV, Sec. 3, to fill by temporary appointment offices which shall become vacant, to nominate three persons for each of the several offices that are to be filled annually, and to decide election in case of a tie.

ARTICLE VI. (Election of Officers and Committees.)

Sec. 1. The election of all officers and the Executive Committee shall be by a mail ballot of active members of the Union, a majority of those voting being required to elect, and the Corresponding Secretary shall send a list of the nominees of the Executive Committee to each member by the first day of November in each year.

Sec. 2. The term of office shall extend from the end of one annual meeting to the end of the next one.

ARTICLE VII. (Meetings.)

Sec. 1. The annual meeting of the Union shall be held at such place as the majority of the members shall by mail ballot select, and at such time as the Executive Committee shall decide.

ARTICLE VIII. (Dues and Assessments.)

Sec. 1. The annual dues of the active members shall be one dollar ($1.00), due at the time of election to membership and on the date of each annual meeting thereafter.

Sec. 2. The annual dues of associate members shall be fifty cents ($0.50), due at the time of election to membership and on the date of each annual meeting thereafter.

Sec. 3. A general assessment may be levied, if, all the members being notified, two-thirds of those voting shall assent.

Sec. 4. In case of failure to pay dues before the close of the year, a member shall forfeit his right to the publications of the Union.

SEC. 5. In case of failure to pay dues for two years a member shall be dropped from the roll of the Union.

ARTICLE IX. (Amendments.)

SEC. 1. An amendment to this constitution may be adopted by an affirmative vote of two-thirds of the active members, one month notice of proposed amendment having been given.

BY-LAWS.

SEC. 1. The actual amount expended by the officers in carrying on their official duties shall be refunded to them.

SEC. 2. All members in good standing shall receive gratis one copy of each of the publications of the Union. Other copies of the publications may be distributed under sanction of the Executive Committee.

SEC. 3. All papers presented at the meetings shall be the property of the Union and shall be filed with the Librarian.

SEC. 4. The order of business at the annual meeting shall be as follows: 1. Reading of minutes; 2. Reports of officers; 3. Reports of committees; 4. Proposal of names and election of members; 5. New business; 6. Announcement of election of officers and committees; 7. Presentation and discussion of papers and remarks; 8. Installation of officers; 9. Adjournment.

SEC. 5. Application for membership must be made to the Executive Committee and such application must have the endorsement of at least one member in good standing, which shall be expected to be a proper recommendation of the candidate.

SEC. 6. Any of the By-laws may be amended or repealed by vote of a majority of the active members.

LIST OF MEMBERS

Corrected to October 1, 1901. Names of charter members indicated by an asterisk.

HONORARY

Crawford, Hon. J. C.....West Point
Furnas, Ex-Gov. Robert W.....Brownville
Miller, Dr. George L.....Omaha
Morton, Hon. J. Sterling.....Nebraska City

ACTIVE

*Ager, J. H., State Warden L. A. S.....1604 F St., Lincoln
*Ashburn, H. B.....Gibbon
*Barbour, E. H., Ph. D., Prof. of Geol., Univ. of Nebr.....Lincoln
*Bates, Rev. J. M., A. M.....Callaway
*Benecke, Frank.....Sybrant, Rock Co.
*Benedict, H. M., A. M., Instr. High School.....221 No. 24th St., Omaha
*Bonwell, J. R.....Nebraska City
*Bruner, Lawrence, Prof. Ent. and Orn., Univ. of Nebr.....Lincoln
*Caldwell, Miss Anna.....920 So. 18th St., Lincoln
*Carriker, M. A., Jr.....Nebraska City
*Cary, Merritt.....Neligh
*Clements, Frederic E., Ph. D., Adj. Prof. Bot., Univ. of Nebr.....Lincoln
Colt, Will C.....Badger
*Condra, Geo. E., A. M., Asst. Prin., High School....5 Halter Blk., Lincoln
*Crawford, J. C., Jr.....West Point
*Dales, J. S., Jr.....1242 P St., Lincoln
*Dickinson, J. A.....Gresham
*Dillon, H. M.....Crete
*Eiche, August.....1133 O St., Lincoln
*Fordyce, Chas., Ph. D., Dean Nebr. Wesleyan Univ.....University Place
*Foster, F. C.....31 Burr Blk., Lincoln
Frey, C. H.....1133 O St., Lincoln
*Froley, J. A.....Stromsburg
*Graves, Bishop A. R., D. D.....Kearney
*Harrison, Miss Nell.....York
*Hayward, Mrs. Mary Smith.....Chadron
*Hershey, H. E.....Nebraska City
*Howe, E. D.....Table Rock
*Hunter, J. S.....1416 15th St., Denver, Colo.
*Hunter, W. D., A. M., Field Agt. U. S. Dept. Agri.....Washington, D. C.
Huntington, Chas. S.....2924 Dodge St., Omaha
Jacobs, Mrs. A. M.....Wayne

*Jones, E. H.....Dunbar
Leffert, Frederick A. C.....West Point
Lobingier, Mrs. Ella B.....1022 New York Life Bldg., Omaha
Loveland, Mrs. G. A.....1347 L St., Lincoln
Lowry, H. B., M. D.....843 So. 10th St., Lincoln
Mullen, R. F.....Cor. Railroad Ave. and Madison St., South Omaha
*Munro, Rev. G. A.....Columbus
Payne, Mrs. Geo. H.....3602 Lincoln Bvd., Omaha
*Pearse, A. S., Instr. High School.....2205 So. 10th St., Omaha
*Penner, J. H.....Beatrice
*Pierce, W. Dwight.....3016 Mason St., Omaha
Pittman, Miss Sadie P.....2022 Webster St., Omaha
*Reed, J. A.....Spokane, Wash.
Reid, Miss Mary A.....607 No. 20th St., Omaha
Scott, E. H.....319 Omaha Nat. Bank Bldg., Omaha
*Shoemaker, F. H.....433 Omaha Nat. Bank Bldg., Omaha
Smart, E. N., M. D.....Madison
*Smith, Will.....Long Pine
*Stewart, W. J.....Fullerton
*Stringer, Miss Caroline.....Wayne
Summers, H. S., M. D.....West Point
*Swenk, Myron H.....20th and L Sts., Lincoln
*Tout, Wilson, Supt. Schools.....Utica
*Towne, Geo. L., Pub. "Nebraska Teacher".....Lincoln
*Trostler, I. S.....4246 Farnam St.
*van Sant, Miss Elizabeth.....2960 Half-Howard St., Omaha
*Walker, A. B.....University Place
Wallace, J. E.....605 So. 13th St., Omaha
*Ward, H. B., Ph. D., Prof. Zool., Univ. of Nebr.....Lincoln
Williams, Rev. John.....523 No. 19th St., Omaha
*Wolcott, R. H., A. M., M. D, Adj. Prof. Zool., Univ. of Nebr.....Lincoln

ASSOCIATE

Anderson, Geo. P.....Dannebrog
Barnell, Sumner.....State Fish Hatchery, South Bend
Bassett, S. C.....Gibbon
*Bell, Mrs. A. T.....2208 T St., Lincoln
Brown, C. O.....State Industrial School, Kearney
*Bruner, Miss Amy.....West Point
*Bruner, Uriah.....West Point
Bruning, W. H.....Cedar Bluffs
Burnett, Miss Lida S.....602 So. 30th St., Omaha
Burnett, Miss Louise O.....602 So. 30th St., Omaha
Carr, Claude.....Lexington
*Cornelius, Mrs. A. B.....Humboldt
*Cross, Rev. R. T.....York

*Dakin, Miss Sarah T.....1826 P St., Lincoln
Franklin, Lew.....1244 S St., Lincoln
*Gleason, Mrs. T.....Utica
*Haecker, A. L., Adj. Prof. Dairy Husb., Univ. of Nebr.....Lincoln
Hinman, C. H.....David City
*Hoobler, Miss Emma.....Long Island, Kans.
Huntington, L. C.....2924 Dodge St., Omaha
*Lanning, W. H.....Hastings
*Love, D. L.....Brownell Blk., Lincoln
McAra, Miss Margaret L.....2437 Harney St., Omaha
Mockett, Ed. R.....2110 A St., Lincoln
Mohler, Wm.....Falls City
Myers, G. W., Supt. Schools.....Harrison
O'Connor, D C., Supt. Schools.....Norfolk
Pepoon, Miss Elsie.....Table Rock
*Peterson, N. F.....Brunswick
*Pierce, Roy G.....3016 Mason St., Omaha
*Sessions, L.....Norfolk
Snodgrass, M. R., Supt. Schools.....Wisner
*Taylor, W. Edgar.....Ruston, La.
*Wolcott, Mrs. R. H.....1826 F St., Lincoln
*Wolfe, Miss Clara.....Peru
Wood, Miss Emily.....2410 Charles St., Omaha

SUMMARY

Honorary members	4
Active members	63
Associate members	36
Total	103

PAPERS

PRESIDENT'S ADDRESS—HISTORY OF ORNITHOLOGY IN NEBRASKA, AND OF STATE ORNITHOLOGICAL SOCIETIES IN GENERAL

I. S. TROSTLER, OMAHA

It is a well established fact that organized work along any of the lines of study or scientific research will yield better and more satisfactory results than will unorganized, individual efforts. The establishment of an ornithological society for Nebraska has been a hobby of mine for a number of years. I have watched the work of other state ornithological societies with considerable interest and it will be my effort to give a short sketch of the work done by the societies of other states and some of the particulars regarding the formation of our Nebraska Ornithologists' Union.

Most of the information regarding the societies of other states was given me by their members, and I desire to thank Messrs. Chester Barlow, of Santa Clara, California; Ora W. Knight, of Orono, Maine; R. H. Wolcott, of Lincoln, Nebraska; Fred. M. Dillie, of Denver, Colorado, and F. L. Burns, of Berwyn, Pennsylvania, for the aid they have given me.

THE COOPER ORNITHOLOGICAL CLUB OF CALIFORNIA

The foremost state ornithological society in this country is the Cooper Ornithological Club of California (named in honor of Dr. James G. Cooper of that state). This club was organized June 22, 1893, at San Jose, by Messrs. W. H. Osgood, F. A. Schneider, H. R. Painton, and Chester Barlow. New members were added from time to time, and at the end of three years the club was upon a firm footing. I am unable to enumerate the exact number of members at the end of each year, until January 1, 1898, when the club had 77 active members. On January 1, 1900, there were 85 and November 1, 1900, 110 active and 3 honorary members.

For convenience in holding meetings the Cooper Ornithological Club is divided into two divisions, a "Northern Division" and a "Southern Division." Both "Divisions" are under the control of what is termed "the Club-at-Large," which has its executive power vested in the "Northern Division." In this way both Divisions act as a unit upon general questions and hold meetings in their portion of the state at regular intervals. The meetings of the Northern Division are held bimonthly, those of the Southern Division monthly. The attendance at the meetings averages 15 to 20 members.

The dues of the club are $1.50 per year.

The publications of the club are of two series: *The Condor*, its official organ, a 24-page bi-monthly magazine (the initial number of which was published in January, 1899), and the *Pacific Coast Avifauna*, which will consist of a series of special papers embracing articles of exceptional merit and too great length to appear in the *Condor*. The first number of the latter series is now published. Before the publication of the *Condor* extracts from the records and papers were published in the *Nidologist* and the *Osprey*.

The present officers of the Cooper Ornithological Club are: Of the Northern Division and the Club-at-Large W. Otto Emerson, Pres.; Theodore J. Hoover, Vice-Pres.; Chester Barlow, Sec.; Donald A. Cohen, Treas. Of the Southern Division A. I. McCormick, Pres.; Frank S. Daggett, Vice Pres.; Howard Robertson, Sec.; and H. S. Swarth, Treas.

It has no members outside of California. Enrolling nearly, if not all, of those interested in ornithology within the state, it has the hearty support of the entire membership, and numbers among its members some of the leading scientists of the country. It is the largest and oldest society of its kind in this country and bids fair to continue its good work.

THE MAINE ORNITHOLOGICAL SOCIETY

The Maine Ornithological Society was organized in 1893 as a corresponding society. The founders were Prof. Wm. L. Powers, of Gardiner, J. C. Mead, of North Bridgeton, and Stephen J. Adams, of Cornish. This organization was first called the United Ornithologists of Maine, the name being changed to the present one in 1899. From the beginning the membership increased steadily, and in 1895 its roll showed 31 members.

In the latter part of 1896 the society commenced its first active work and secured space for the publication of its proceedings in the *Maine Sportsman*. The membership in January, 1897, was about 50, consisting of active, honorary, corresponding and associate members. In December, 1896, the first meeting of the society was held at Gardiner, and since that time annual meetings have been held each year, in January, 1898, at Portland; in December, 1898, at Waterville; in December, 1899, at Brunswick, and in December, 1900, at Lewiston.

In 1897 a List of the Birds of Maine was published under the auspices of this society by the Maine State College. In January, 1899, the society began the publication of the *Journal of the Maine Ornithological Society*, a 12 page quarterly, in which were published the proceedings and papers presented at their meetings.

The first officers of the Maine Ornithological Society or, as it was then called, the United Ornithologists of Maine, were: Stephen J. Adams, Pres.; Prof. Chas. B. Wilson, Vice Pres.; Ralph Rockwood, Treas., and Prof. W. L. Powers, Sec. The officers for 1900 were Prof. W. L. Powers,

Pres.; Capt. H. L. Spinney, Vice-Pres.; A. H. Norton, Sec.-Treas.; J. Merton Swain, Editor; and Professors A. L. Lane and O. W. Knight, Councillors.

Up to 1896 the annual dues were 50 cents, but in that year they were increased to $1.00. This society is an active one and is doing good work.

THE IOWA ORNITHOLOGICAL ASSOCIATION

The Iowa Ornithological Association was organized as a correspondence association, June 15, 1894, and in October of that year had 20 active, 4 associate, and 2 honorary members. In January, 1897, the membership was 51 active, 22 associate, and 3 honorary members.

In 1895 work was begun upon a List of Iowa Birds by a committee appointed for that purpose. The work is not yet completed.

The first meeting of the Iowa Ornithological Association was held at Iowa City, August 22 and 23, 1895, 9 active members being in attendance. The second annual meeting was held at Mount Vernon, July 29 to 31, 1896, and the third annual meeting at Manchester, September 1 to 4, 1897. No meetings have been held since 1897. The publication of the *Iowa Ornithologist* was begun by the association in October, 1894. It was a 16 to 28-page quarterly. The last number was issued January, 1898.

The first officers of the Iowa Ornithological Association were: Ernest E. Irons, Pres.; Carleton R. Ball, Vice-Pres.; David L. Savage, Sec., and W. W. Loomis, Treas. The officers for 1898 were: J. H. Brown, Pres.; Mrs. M. A. Treim, Vice-Pres.; J. Eugene Lew, Sec.; and David L. Savage, Editor and Treas.

Originally the dues of this association were 25 cents per annum, but this was changed to 40 cents per annum. In 1895 the dues were again changed to $1.00 per annum for active and 40 cents per annum for associate members.

Although from outward appearances the Iowa Ornithological Association is dead, I have information from some of its members that they feel sure that they will be able to revive the old life and interest, and from what I know of the members I think that they will succeed, and trust that the association will in time shake off its lethargy and reassume its former activity.

THE MICHIGAN ORNITHOLOGICAL CLUB

The Michigan Ornithological Club was organized as the Kent Ornithological Club, December 5, 1894, at Grand Rapids. At that time the membership consisted of young students with but two or three older heads to guide and direct. The Kent Ornithological Club remained as a local club for about one year, until in 1895 applications came from ornithologists in different parts of the state for admission to the club. In this way the Kent Ornithological Club became the Michigan Ornithological Club on December 12, 1895, with 13 charter members. Meetings were

held in Grand Rapids and the organization was practically controlled by the local members. A number of the members of the old society ceased to take part in the work of the club on account of their opposition to the expansion into a state organization and the membership increased very slowly. In February, 1897, the club numbered 37 active, 16 associate, and 8 honorary members, and by the end of that year 53 active, 41 associate, and 9 honorary members were upon the roll. In December, 1898, there were 57 active, 68 associate, and 9 honorary members.

In January, 1897, the publication of the *Bulletin of the Michigan Ornithological Club* was commenced. It was a 12-page quarterly, the last number published being dated April, 1899. Later a movement was started with the object of inducing the Michigan Academy of Sciences to publish the proceedings of the club, but so far without result.

In December, 1897, the first meeting away from Grand Rapids was held at Lansing and a new constitution was adopted. The last annual meeting was held in Detroit, December 27, 1898, where an effort to stir up some of the old-time enthusiasm was made. This seems to have failed as the club is now in a dormant state. The annual dues were 50 cents for associate and $1.00 for active members.

The first officers of the Michigan Ornithological Club were: A. R. Durfee, Pres.; R. R. Newton, Vice-Pres.; W. Earle Mulliken, Sec.; C. A. Whittemore, Treas. The officers elected at the last annual meeting were: W. A. Davidson, Pres.; James B. Purdy, Vice-Pres.; L. Whitney Watkins, Sec.; Mrs. F. A. Kelsey, Treas.; and Benton R. Laraway, Librarian.

With the membership that this club had, there is no reason why they should not reorganize and I trust this will soon be accomplished.

THE COLORADO ORNITHOLOGICAL ASSOCIATION

Something over a year ago the Colorado Ornithological Association was organized in Denver. A few meetings were held and the association seemed to fall asleep. The only information which I could obtain regarding it is embodied in a recent letter from Mr. Fred M. Dille, wherein he states, "The Colorado Ornithological Association is practically extinct. It has never really mutually agreed to disband so perhaps it still exists and is only sleeping, like a skin which may be relaxed some day. We quit holding meetings, and that was about the end of it. There are good ornithologists in the state, but they could never get together on account of the expense."

THE DELAWARE VALLEY ORNITHOLOGICAL CLUB

Although not strictly a state organization, the Delaware Valley Ornithological Club may properly be enumerated under this head, as the control of the club is in the hands of the active members, all of whom reside in Pennsylvania.

This club was organized in Philadelphia, February 3, 1890, with 7 members. The officers at that time were Wm. L. Bailey, Pres., and S. M. Rhoads, Sec.-Treas. In 1892 there were 9 active and 17 associate members and in 1898 there were 14 active, 42 associate, and 21 corresponding members. The dues are $2.00 per annum for active and $1.00 for associate members. Meetings are held twice each month, from October to May inclusive, in the Ornithological Room of the Academy of Natural Sciences, Logan Square, Philadelphia.

The publications issued by this club up to this time are: Abstracts of Proceedings of the Delaware Valley Ornithological Club for 1890-91; the same for 1892-97; and the same for 1898-99. The Birds of Eastern Pennsylvania and New Jersey (185 pp., frontispiece and 2 maps).

THE NEBRASKA ORNITHOLOGISTS' UNION

In January, 1894, I published a notice in the *Oologist* of Albion, New York, requesting Nebraskans interested in ornithology and oology to send me their addresses. I received replies to this notice from C. C. and M. Pew, Hebron; J. S. and A. Pyfer, Odell; L. J. Pickett, Wahoo; R. S. Waugh, Plattsmouth; F. C. Benecke, Chadron; H. W. Kerr, Hastings; A. Wilson Tout, Riverton; J. A. Dickinson, Gresham; and one or two others. I corresponded with these with reference to meeting at some central point for the purpose of forming a state organization but for various reasons we could not "get together." In 1895 I again essayed the bringing together of these bird students for this purpose, and as before I failed.

In 1896 I tried to arrange for a meeting during the State Fair in Omaha, but I could not secure enough who would promise to be here at one time to secure a representative meeting, so I let the matter rest until early in 1898, when I wrote to about twenty-five ornithologists in this state asking if they could and would try to visit the Trans-Mississippi Exposition at a time suitable to the largest number so that we could have a meeting and organize. I also had a notice to this effect published in the *Museum*, of Albion, New York, and in the *Osprey* for April and May, 1898. A number of those written to replied to my letters, but their dates were quite various, and as most of them could not be changed I finally concluded that it would be useless to try and organize in this way. A number of these persons called upon me during the summer of 1898 while visiting the Exposition and all of them seemed to favor the organization of a state association.

In May, 1899, after a short correspondence, J. R. Bonwell and M. A. Carriker, of Nebraska City; J. A. Dickinson, of Gresham, F. H. Shoemaker, Miss van Sant, and myself, of Omaha, arranged a preliminary organization, which was named the Nebraska Ornithologists' Association. About this time the existence of the Nebraska Ornithological Club of Lincoln, which had been organized about three months before, was brought to our notice by Dr. Wolcott and Prof. Bruner, and

with a view of more satisfactorily arranging matters we petitioned the Nebraska Ornithological Club to open their membership to the entire state.

The Lincoln organization appointed a committee, of which Mr. W. D. Hunter was chairman, to correspond with refernce to the organization of a state society and May 26, 1899, the committee sent a letter to all whom they knew to be interested in ornithology in this state, stating the matter in hand and outlining a plan of organization, with the happy result that on July 15, 1899, an election was called by the committee which resulted, forty-three persons participating, in the election of the following officers of the preliminary organization: Prof. L. Bruner, Lincoln, Pres.; I. S. Trostler, Omaha, Vice-Pres.; W. D. Hunter, Lincoln, Cor. Sec.; R. H. Wolcott, Lincoln, Rec. Sec.; J. R. Bonwell, Nebraska City, Prof. Chas. Fordyce, Lincoln, and Rev. J. M. Bates, Long Pine, Executive Committee.

The first annual meeting of Nebraska ornithologists was called to meet at Lincoln, December 26, 1899, and at this meeting the permanent organization of the Nebraska Ornithologists' Union was effected, constitution and by-laws adopted and officers elected.

With the election of those whose applications are now at hand the Union will have over ninety active and associate members. The proceedings of our first annual meeting were published in a neat pamphlet and from present indications our organization is on a sound footing, with prospects of a bright and useful future.

BIRDS IN THEIR RELATION TO AGRICULTURE

LAWRENCE BRUNER, LINCOLN

When civilized man takes possession of new regions and begins cultivating the soil and establishes his sovereignty there, the equilibrium as it existed upon his arrival is very quickly disturbed. One or more of the many forms of life—plant and animal—that were previously held within certain limits gain ascendency. The introduction of new crops that furnish an abundance of the proper food for some insect, enables this form to increase out of all proportions and harm soon results. The killing off of certain other forms of life that naturally keep still others in check also assists in disturbing the equilibrium further. The cutting down and clearing away of forests removes the shelter and homes of others, as does also the turning under of prairie grasses. Then, too, many of the natural residents of primeval forests and virgin prairies shun the sight of man, hence they gradually withdraw from the region, and their influence for good or evil goes with them. Since the majority of such forms are timid and inoffensive creatures, their withdrawal only adds that much more to the already

overbalanced conditions. Year by year the gap which at first was scarcely noticeable becomes widened, so that frequent inroads are made and harm results. Instead of trying to ascertain the true cause for all this trouble perhaps exactly the wrong thing is done by the settlers. This of course only has the effect of further widening the gap between safety and danger. Since an insect or other animal becomes noticeably harmful only when present in alarming numbers, it stands to reason that anything which favors such an abnormal increase is a factor in disturbing nature and should be quickly rectified where possible. In order that these disturbances should be looked after the all-wise God of the universe created birds and gave them the power of flight that they might the more readily move about rapidly from place to place where their services might be needed in balancing affairs. Hence birds have naturally and rightfully been called the "balancers" in nature. This being true, let us see just what their relations are to agriculture.

The farmer sows in order that he may reap an increased measure of what he has sown. In doing this he must first turn over the soil. This destroys many existing plants as well as animals that depend upon them for food. The plants thus turned down cannot regain their position and must of necessity die. Not so with many of the animals, however, which soon work their way to the surface. Some of these attack the growing plants which have been made to occupy the place of those destroyed by the plow. Others take wing and seek suitable food in adjoining districts where they add to the numbers already drawing upon the vegetation up to the point of possible continued supply. Here, then, the scales begin to vibrate. In the field the new and tender crop entices the ever-shifting individuals of myriads of forms that have been crowded out elsewhere. The result here too is, or would be, very disastrous were it not for the timely visit of flocks of birds likewise in search of food.

It is during the period of first settlement of a country, when the fields are small, few and widely separated, that injury may and frequently does result from birds. It is then a problem that needs careful consideration, not only for the time being, but also for the future welfare of that country. If animal life is destroyed indiscriminately and without intelligent forethought, calamities unforeseen are sure to follow in the not distant future.

Birds can be useful to man in many ways. They can benefit him by carrying the seeds of various plants from place to place so as to assist him in establishing new groves in which to find shelter from the cold in winter and refuge from the heat of the noonday sun in summer. They plant various shrubs by the wayside that spring up and later are laden with luscious fruit. They also carry the spawn of fishes and small crustaceans among their feathers into new waters, and feed upon the countless seeds of weeds that are scattered broadcast over

the face of the earth. Some kinds live almost exclusively upon insects, while others hunt out the small rodents that would, if left to themselves, destroy great quantities of grain and other vegetation. Still other birds benefit mankind by acting as scavengers in the removal of putrid and other offensive matter which would endanger our health. In addition to all these varied direct benefits which are brought about by the presence of birds, man is further indebted to these creatures for the cheer which their gay music, bright plumage and pleasant manners bring to him. The birds form a carefully organized army of police which is engaged in keeping affairs balanced in nature.

But we can go even further summing up the benefits that men may derive from the birds. A great many kinds make excellent food, while others furnish sport and pleasure to a large number of men and boys who seem to require a certain kind of entertainment while accompanied with dog and gun. Dead birds when embalmed as mummies and attached to the head-gear worn by some girls and women are also claimed to cause much happiness.

Birds as Enemies.—It would be ridiculous for me to assert here that no injury ever results from the presence of birds on the farm or in the orchard. Quite a number of different species are continually stepping over to the wrong side of the "ledger" as it were, and commiting depredations of various kinds which if considered alone would render the perpetrators liable to severe punishment—in some cases even unto death. Some of the crimes that can be charged to the feathered tribe are cherry and berry-stealing, grape-puncturing, apple-pecking, corn-pulling, grain-eating, the unintentional carrying from place to place of some kinds of scale insects that happen to crawl on their legs and feet, the possible spreading of hog cholera by crows and buzzards, the robbing of the poultry yard, and lastly some birds are accused of making noises that awaken us from our slumbers in the morning.

Some of these crimes are genuine and are to be deplored, while others are more imaginary than real. A few of them could be prevented in part or altogether, while others might be diminished if we were inclined to take the trouble to do it.

After all that can be said pro and con concerning the usefulness of birds in general there remains no doubt, in the minds of thinking people at least, as to the value of these creatures. It is only the vicious, biased, and thoughtless persons who continue ruthlessly to destroy birds indiscriminately without first pausing to consider whether or not it is a proper thing to do, whether it is right or wrong.

Food habits.—So varied is this task of evening up in nature mentioned above that if attended to properly the workers must be numerous in individuals and possess widely different habits. That such is the case can readily be seen by the following brief account of the various groups of our Nebraska birds, along with brief statements of their food-habits.

The Grebes and Loons feed chiefly upon snails and other aquatic animals such as are found about their haunts. They also capture many grasshoppers and similar insects that happen in their way. They cannot, therefore, be classed among the especially beneficial birds, neither can they be termed injurious on account of what they eat.

The Gulls, provided as they are with long wings and great powers for flight, are not confined to the sea-coast, hence they reach far inland in their migrations, feeding extensively upon insects like locusts, June-beetles, crickets, etc., large numbers of which they destroy annually. Several kinds of these birds are known to follow the plow and pick up the white grubs and other insects that are turned up and laid bare. In early days, when grasshoppers did much harm in this state, numerous flocks of these birds were seen to feed upon these insects.

The Cormorants and Pelicans are chiefly destroyers of fishes and frogs, hence can hardly be classed among the most beneficial forms; but whether or not they do any more than to maintain the necessary equilibrium in that particular part of the vast field of nature it is difficult to judge without time for investigation.

The various Ducks and Geese which are also nearly as aquatic in their habits as some of the foregoing, frequently leave their haunts and make excursions into the surrounding country where in summer they feed upon locusts, beetles and other injurious insects. They also partake of considerable quantities of vegetable food, as grains, weed seeds, grasses and other herbage. While not included among the insectivorous forms these birds do much towards diminishing the ever increasing horde of creeping and jumping things. Ducks and geese on the other hand are largely utilized by us as food; while their feathers make comfortable pillows and coverlets.

The Herons, Cranes, and Rails are frequenters of marshes and the margins of streams and bodies of water, where they assist in keeping the various forms among the animal life balanced. Fishes, frogs, snails, insects, and crustaceans are alike devoured by them.

The Snipe, Sandpipers, Plovers, Phalaropes, Curlews, etc., are great destroyers of insects. Moving as many of them do in great flocks and spreading out over the meadows, pastures, and hillsides, as well as among the cultivated fields, they do a large amount of careful police service in arresting the culprits among insects. They even pry them out of burrows and crevices in the earth where these creatures lurk during daytime only to come forth after nightfall to destroy vegetation. The large flocks of Eskimo Curlews that formerly passed through eastern Nebraska did magnificent work during years when the Rocky Mountain Locust was with us, as did also the equally large flocks of Golden Plovers. The Bartramian Sandpiper even now is a great factor each summer in checking the increasing locusts on our prairies.

The various members of the Grouse family, while belonging to a grain-eating group, are certainly quite prominent as insect destroyers.

Especially is this true with respect to the Quail, Prairie Hen, Sharptailed Grouse, and Wild Turkey, all of which are occupied most of the summer months in capturing and destroying vast numbers of such insects as are found on the prairies. Grasshoppers, locusts, crickets, caterpillars, and similar insects comprise the bulk of their insect food—forms that are all among the most numerous as well as destructive species. In writing about these birds as insect destroyers Prof. Samuel Aughey writes:* "I happened to be in the Republican Valley, in southwestern Nebraska, in August, 1874, when the locust invaded that region. Prairie chickens and quails, that previous to their coming had a large number of seeds in their stomachs, when dissected, seemed now for a time to abandon all other kinds of food. At least from this onward for a month little else than locusts were found in their stomachs. All the birds seemed now to live solely on locusts for a while." In winter and at other times of the year when insect life is scarce and difficult to obtain these birds feed more or less extensively upon seeds and other kinds of vegetation. Some even enter cultivated grounds and seek food that belongs to the farmer, thereby doing more or less direct injury. The extent of such injury, of course, depends upon the number of birds engaged in the depredations, and also on the time over which it is allowed to extend. If corn and other grain is harvested at the proper time, but little damage ensues; but if allowed to remain in the field throughout winter, much of the crop is liable to be taken by the birds.

Perhaps no other bird that frequents the farm pays higher prices for the grain it eats than does the Quail. Living about the hedgerows, groves, and ravines, where insect enemies gather and lurk during the greater part of the year, this bird not only seizes large numbers of these enemies daily during the summer months when they are "abroad in the land," but all winter through it scratches among the fallen leaves and other rubbish that accumulates about its haunts seeking for hibernating insects of various kinds. Being a timid little creature, the Quail seldom leaves cover to feed openly in the fields, and therefore does but little actual harm in the way of destroying grain. In fact it only takes stray kernels that otherwise might be lost. This bird is one of the few that feeds upon that unsavory insect, the chinch-bug; and the number of this pest that occasionally are destroyed by it is really astonishing. No farmer or fruit-grower should ever kill a quail himself nor allow anyone else to hunt it on his premises.

Our domestic fowls, save ducks and geese, from which so much direct income is derived throughout the year, belong here. It would be folly on my part to assert that they are useless to the farmer. Besides furnishing eggs and meat for the table, they are great aids in keeping down a variety of noxious insects during spring, summer and fall.

The various species of Doves or Pigeons are not, as a rule, thought

*See 1st Report U. S. Entomological Commission, p. 361.

of as being especially harmful, yet repeated examinations of their stomach contents would indicate that their food seldom, if ever, consists of anything but grains and various kinds of seeds along with other particles of vegetation. The good done by these birds as destroyers of weed seeds more than pays for the harm done by them as grain-eaters.

Recent careful study with reference to the food habits of Hawks and Owls carried on by the United States Department of Agriculture go to show that these birds, with but few exceptions, are the farmer's friends rather than his enemies. It appears that the good which they accomplish in the way of destroying mice, gophers, rabbits and other small mammals along with great quantities of noxious insects far exceeds the possible harm they do by the occasional destruction of poultry and other birds. A critical examination of the actual contents of about 2,700 stomachs of these birds showed that only six of the seventy-three species found in the United States are injurious. Three of these are so rare that they need not be considered. Of the remaining three the Fish Hawk is only indirectly injurious; hence but two remain to be considered, viz., the Sharp-shinned and Cooper's Hawks. "Omitting the six species that feed largely on poultry and game, 2,212 stomachs were examined, of which 56 per cent contained mice and other small mammals, 27 per cent insects, and only 3½ per cent poultry and game birds."

The food habits of both the Turkey Vulture and the Carrion Crow, or Black Vulture, are of such a nature that the destruction of these birds should be prohibited. In fact, in many of the states this is done by law. They live almost exclusively upon carrion or decomposing animal matter, and in this manner aid in the prevention of diseases that might result from the presence of such filth. They may, however, be the cause of indirectly spreading hog cholera where animals that have died from this disease are left unburied or unburned.

The Cuckoos are among the few birds that habitually feed upon hairy caterpillars, such as the various "tent-making" species. They also destroy large numbers of other caterpillars, and do not object to beetles and other insects which they find among the foliage of trees. Although shy birds they are frequently seen in cities, where they do their share in protecting the shade trees from the ravages of insect defoliators.

Taking the Woodpeckers as a family, there are few persons but who will readily admit that these birds comprise a very useful group. Feeding, in fact, as most of them do, upon the larvæ of wood-boring insects, they can readily do much greater good for the actual number of insects destroyed than if they destroyed only those that feed upon the foliage of trees. Not unfrequently will a single borer kill an entire tree if left to itself, while hundreds of foliage-feeding caterpillars of the same size have but little effect upon the appearance, to say nothing of the health, of the same tree.

Mr. F. E. L. Beal, assistant in the Division of Ornithology and Mammalogy of the United States Department of Agriculture, in summing up the results obtained from the examination of 679 stomachs of these birds, writes as follows:*

"In reviewing the results of these investigations and comparing one species with another, without losing sight of the fact that comparative good is not necessarily positive good, it appears that of seven species considered the Downy Woodpecker is the most beneficial." He then goes on to give the food habits based on contents of the stomachs of our most common species. "Judged by the stomach examinations of the Downy and Hairy Woodpecker and Flicker it would be hard to find three other species of our common birds with fewer harmful qualities."

The Flicker is one of our most common woodpeckers in Nebraska and does much towards keeping down a number of different kinds of insects. It is very fond of ants as a diet, in fact is partial to them, and this element forms almost half of its entire food-supply during the year. It also occasionally feeds upon the chinch-bug, as can be attested by the fact that the stomach of a specimen killed near Lincoln contained in the vicinity of 1,000 of these bugs. It is also a fruit-eater to the extent of about one-quarter of its entire bill of fare, but nature, not man, furnishes the supply. It takes the wild kinds in preference to those that are cultivated.

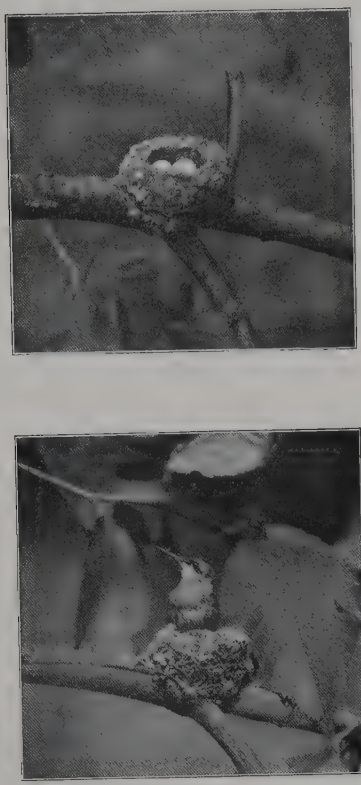
The Whippoorwill, Night Hawk, and Swifts feed entirely on insects, and must consequently be classed among the beneficial birds. They all capture their prey while upon the wing, and naturally destroy large numbers of troublesome kinds.

The various species of Flycatchers, as the name implies, destroy insects which they capture for the most part while on the wing. Flies and allied insects are quite prominent on their bill of fare; but these by no means are the only kinds of insects destroyed by them. Many a luckless locust, butterfly, moth or even beetle is snapped up and devoured by the different species of the family. The Bee-bird, or Kingbird as it is more frequently called, sometimes even catches bees. These latter, however, consist largely of drones, hence comparatively little harm is done.

One should be unprejudiced in order to write a fair biography of even a bird, or group of birds. To say that I am without such prejudice with reference to some of the members of the family of birds now to be considered, would be a falsehood. Still, I shall endeavor to give as unbiased testimony as possible with reference to their food-habits at least, and let the reader judge for himself as to what would be the proper treatment for these birds. Taking the family as a whole that which is made up of birds like the Crows, Ravens, Magpies, Jays, Nut-crackers, "Camp-robbers," etc., though some of them have unenvi-

*See Bull. No. 7, Div. Ornith. & Mammalogy, p. 9.

PLATE II



NEST OF THE RUBY-THROATED HUMMINGBIRD

able names and reputations at least, are not really as bad as we are sometimes requested to believe them to be.

The Crows, Ravens, Magpies, and immediate relatives are what might be termed "omnivorous" in food-habits, eating everything that comes their way. Crows, however, have been shown to feed largely on insects, which in great measure at least, offsets the harm done in other directions. They also feed on various substances, the removal of which is for the general good.

The Raven is too rare a bird in this state to be taken into consideration in respect to food-habits, and the Magpie certainly can be put out of the question of doing any possible harm for the same reason. This leaves then to be considered, the Jays, of which we seem to have six or seven distinct kinds; but only two of these are at all common. The Blue Jay is found over the entire state, and is familiar to everybody. The second species is found only in the western and northwestern portions among the pine forests, and is known as the Pinon Jay or "Camp-robber"- the latter name not very flattering to the bird I must confess.

The Blue Jay does much of the mischief that is laid at the door of the Robin, orioles, thrushes, and other birds, and then sneaks away unobserved. He also destroys large numbers of insects and robs the nest of some small birds.

In the Bobolink, Meadowlark, Orioles, and Blackbirds we have some of the most important insect destroyers among the feathered tribes. The Bobolink is with us only during the summer months when it is entirely insectivorous; and the same can be said of the Cowbird, although the latter has the bad habit of compelling other birds to rear its young.

In the Red-winged Blackbird we have a friend that we little dream of when we see the large flocks gathering about our corn-fields during late summer and early fall. During the balance of the year it is engaged most of the time in waging war on various insect pests, including such forms as the "grub-worms," cut-worms, grasshoppers, army worm, beet caterpillar, etc. Even when it visits our corn-fields it more than pays for the corn it eats by the destruction of the worms that lurk under the husks of a large per cent of the ears in every field.

Several years ago the beet fields in the vicinity of Grand Island were threatened great injury by a certain caterpillar that had nearly defoliated all the beets growing in many of them. At about this time large flocks of this bird appeared and after a week's sojourn the caterpillar plague had vanished, it having been converted into bird tissues. Numerous other records of the efficiency of their labor as destroyers of insect pests might be quoted in favor of this bird, but I do not believe this to be necessary, although considerable evidence has been recorded of its destroying both fruits and grains.

The Baltimore Oriole has received such a bad reputation here in Ne-

braska as a grape thief during the past few years that I feel inclined to give extra time and space in endeavoring to "clear him" of such an unenviable charge. This, however, I hardly think necessary when the facts in the case are known. As insect destroyers both this bird and the Orchard Oriole have had an undisputed reputation for many years; and the kinds of insects destroyed by both are of such a class as to count greatly in their favor. Caterpillars and beetles belonging to injurious species comprising 96 per cent of the food of three specimens killed is the record we have in their favor. On the other hand, grapes have been punctured only "presumably by this bird, since he has so frequently been found in the vineyard and must be the culprit." Now I myself have seen the Oriole in apple orchards under compromising circumstances, and have heard pretty strong evidence to the effect that it will occasionally puncture ripe apples. It also belongs in the same family with some generally accepted "rascals," hence I will admit that possibly some of the charges with which he is credited may be true; but I still believe that most of the injuries to grapes in this and other states must be laid to the English Sparrow.

If we take pains to water our birds during the dry seasons they will be much less apt to seek this supply from the juices of fruits that are so temptingly near at hand. Place little pans of water in the orchard and vineyard where the birds can visit them without fear of being seized by the house cat or knocked over by a missile from the alert "small boy," and I am sure that the injury to fruit, to a great extent at least, will cease.

Recent investigations tend to prove that the Grackle or Crow-Blackbird does more good than harm and should be protected.

Our Sparrows and their allies, taken together, form a very extensive family of very beautiful as well as useful birds. Like the warblers, they occupy themselves with searching for and destroying insects all summer long; but this is not all they do that is good. In fall, winter, and early spring, when Mother Earth has lost her brilliant green and rests in sombre browns or beneath ice and snow, the longspurs, Snow Bunting, Snowbird, and some of the sparrows that have remained with us are busily engaged in gathering for themselves a living. They hop and fly about from place to place searching for and picking up little seeds of grass, grain and weeds, of shrubs and trees, and appropriating the same to their use, chirping merrily as they work away. The European House Sparrow, or the English Sparrow as it is more commonly called, has the worst reputation of the entire family. But even this bird has some redeeming traits.

The Tanagers are insect destroyers, feeding for the most part on such forms as attack the foliage of trees.

All of our Swallows are insect destroyers, capturing such forms as gnats, flies, etc., which they seize while on the wing. The large colonies of different species of these birds that breed within the state, as

well as those that pass through during their migrations, destroy vast numbers of these insects. They should be protected.

The Waxwings, both the Cedar Bird and Bohemian Waxwing, feed principally upon berries, etc., which they find throughout the year. Still, in his studies of the food contents of the stomachs of a variety of birds taken in a certain orchard that was overrun with canker-worms, Professor Forbes found that the seven specimens of the Cedar Waxwing had eaten nothing but canker-worms and a few dung beetles, the latter in such small numbers as to scarcely count. The number of caterpillars eaten by each bird ranged from 70 to 101.

The Shrikes or "Butcher Birds" are known as veritable "brigands" or "pirates" when it comes to the destruction of other forms of life. They are true to their name, and "butcher" for pastime large numbers of insects, mice, lizards, small snakes, and even a few birds. They then fly to some thorn bush or barbed-wire fence and impale the luckless victim and leave it for future use, or to dry up and finally blow away. The good they do will outweigh the harm.

The food of the various Greenlets or Vireos is made up almost entirely of insects, of which a large per cent are caterpillars, such as infest shade trees and the larger shrubs. They should be protected and encouraged, about the orchard in particular.

In the words of that pleasing writer, Dr. Elliott Coues,* "The Warblers have we always with us, all in their own good time; they come out of the south, pass on, return, and are away again, their appearance and withdrawal scarcely less than a mystery; many stay with us all summer long, and some brave the winters in our midst. Some of these slight creatures, guided by unerring instinct, travel true to the meridian in the hours of darkness, slipping past like a 'thief in the night,' stopping at daybreak from their lofty flights to rest and recruit for the next stage of the journey. Others pass more leisurely from tree to tree, in a ceaseless tide of migration, gleaning as they go; the hardier males, in full song and plumage, lead the way for the weaker females and yearlings. With tireless industry do the warblers befriend the human race; their unconscious zeal plays due part in the nice adjustment of nature's forces, helping to bring about the balance of vegetable and insect life without which agriculture would be in vain. They visit the orchard when the apple and pear, the peach, plum, and cherry are in bloom, seeming to revel carelessly amid the sweet-scented and delicately-tinted blossoms, but never faltering in their good work. They peer into the crevices of the bark, scrutinize each leaf, and explore the very heart of the buds, to detect, drag forth, and destroy those tiny creatures, singly insignificant, collectively a scourge, which prey upon the hopes of the fruit-grower, and which, if undisturbed, would bring his care to naught. Some warblers flit in-

*Key to North American Birds, p. 288.

cessantly in the terminal foliage of the tallest trees; others hug close to the scored trunks and gnarled boughs of the forest kings; some peep from the thicket, coppice, the impenetrable mantle of shrubbery that decks tiny water-courses, playing at hide-and-seek with all comers; others more humble still, descend to the ground, where they glide with pretty mincing steps and affected turning of the head this way and that, their delicate flesh-tinted feet just stirring the layer of withered leaves with which a past season carpeted the ground. We may seek warblers everywhere in the season; we shall find them a continued surprise; all mood and circumstance is theirs."

Much could be written concerning the food-habits of the various members of the group of Thrushes, Mocking-birds and Wrens. Three of the species at least are known to be more or less destructive to fruits, viz., Catbird, Brown Thrasher, and Mocking-bird. Still, if we take into account what these birds eat during the entire time spent within the state, the balance sheet stands in favor of the birds as insect destroyers. The wrens are pre-eminently insect destroyers, and the others are not much behind them in this respect.

The members of the family of Nuthatches and Tits feed for the most part on insects. But we lack very definite figures regarding the kinds and numbers of insects that each destroys. We can be sure, however, that any favors shown them will not be thrown away.

The Thrushes, Solitaires, Bluebirds, etc., are all beneficial as insect destroyers, and might be well compared with the Robin, which is described quite fully beyond, only they are even less liable to commit injuries to fruits.

The Robin has certainly been accused often enough of being a first-class rascal to warrant the belief that there must be at least some grounds for such accusations being made. In his examination of 114 stomachs of this bird, taken during ten months of the year, Professor Forbes, of Illinois, found the contents to consist of 65 per cent insects and 34 per cent of fruits and seeds. In the estimates of these food percentages taken by the Robin, as well as by other birds, bulk for bulk is taken, i. e., a quart of caterpillars or other insects is equivalent to a quart of cherries or a quart of berries. Professor Forbes asks this question: "Will the destruction of seventeen quarts of average caterpillars, including at least eight quarts of cut-worms, pay for twenty-four quarts of cherries, blackberries, currants, and grapes?" and then answers it in these words: "To this question I, for my own part, can only reply that I do not believe that the horticulturist can sell his small fruits anywhere in the ordinary markets of the world at so high a price as to the Robin, provided that he uses proper diligence that the little huckster doesn't overreach him in the bargain."

Much more might be said in favor of the Robin had I the time and space at my command.

After having carefully scanned the foregoing notes concerning the

food-habits of our birds we cannot afford to continue indifferent in our treatment of them, nor can we even allow our neighbors to kill them though we ourselves have decided to reform in this respect. We must work for a change of heart in our neighbors also.

INJURIOUS TRAITS OF THE BLUE JAY

E. D. HOWE, TABLE ROCK

Ornithologists, like other people, seem to be subject to the laws of fashion. It is very much in style for every one who writes about birds to condemn the English Sparrow, without any very good reason that I could ever discover, and it it equally fashionable to argue that the Blue Jay is a pretty good sort of a bird, in spite of its bad reputation. We are told that chemical analysis only reveals the presence of birds' eggs in about one per cent of the stomachs examined. Before accepting this as an entire vindication of the Blue Jay's character, I should want more particulars as to the time of year when those examinations were made, and how many birds' eggs were available as an article of diet at the time of each examination. From my observations, I should say that if a Jay is captured at any time when he has not been eating eggs, it is owing to his inability to get any, and not from any conscientious scruples in the matter.

Now as to what I have seen. On one occasion I observed a Blue Jay sitting on the side of a nest, pecking vigorously at something within. I climbed up to the nest and secured a mourning dove's egg with a hole in the side. This, to me, is more convincing evidence than any number of chemical analyses. At another time I saw a Jay making the same motions at an orchard oriole's nest, but in this case I was not able to examine the nest. Having thus obtained positive knowledge of the Blue Jay's habits, when I have found eggs disappearing from nests of robins, kingbirds and mourning doves, I have charged them all up to the Jays, possibly at times unjustly. I have, however, another reason for believing in the predatory habits of the Blue Jay, and that is the instinct of other birds. Whenever a commotion is heard in the tree tops, a Jay can generally be found responsible for it. I grew quite familiar last summer with a certain scolding note from the Warbling Vireo, and close observation would generally show a Jay near its nest. I do not think the birds would universally recognize the Blue Jay as an enemy unless they had some reason for it.

Around my own home, Blue Jays seem to be supplanting other birds. robins, orioles, and blackbirds, formerly numerous, seem to be getting scarcer every year, while Blue Jays and Blue Jays' nests are to be seen everywhere. It is customary to accuse the English Sparrow

of being responsible for the disappearance of all other birds, but in southeastern Nebraska, at least, I believe the charge to be unfounded for this reason. It is the House Wren particularly that the Sparrow is accused of driving off, and on Orchard Grove farm, where I live, the House Wren is the one kind of bird, except the Blue Jay, that seems to get more numerous every year. The reason, to me is clear. It is not the English Sparrow, but the Blue Jay, that is driving off the birds, and the Wrens build their nests in places where the Jays can not get at them.

Now I have a little story to tell concerning another phase of the Blue Jay's food habits. The Blue Jay can eat kernels of corn, which small birds can not do. It happened once that I had a crib of corn some distance from the house, unused during the summer. It was covered with hay, but at one corner the covering got off, leaving the corn exposed. I saw Blue Jays flying to that hole during the summer. When in the fall I emptied the crib, there were at least half a bushel of empty cobs by that hole in the cover.

I am therefore convinced that from the standpoint of a Nebraska farmer, Blue Jays are injurious, and we should do our best to put a check to their increasing numbers.

ORNITHOLOGY IN THE SCHOOLS

WILSON TOUT, UTICA

In a paper read before the Nebraska Ornithologists' Union last year I attempted to give the reasons why the study of the birds should be a part of the curriculum of every public school. It again becomes a pleasant task to discuss the subject along educational lines, but I shall not again attempt to make an extended plea for the introduction of elementary ornithology into the schools of the state.

The solution of the bird protection problem can never be reached by courts, laws, or officers. The small boy is one of the chief offenders, and these vestments of authority seldom cover or even reach his thoughtless acts of destruction. If all of the boys could be shown the harmful results of killing the birds and destroying their nests what an army for bird protection there would be within a few years. If the girls were taught the folly of pandering to the demands of fashion when it calls for the sacrifice of countless innocent victims the game wardens now needed to protect our birds would have to seek some other vocation if they would still prosper. The school is the foundation of reform movements in other lines—why not in this?

In the former paper I gave the why and where; in this paper I shall attempt to give the how and when of bird study.

The first objection ventured to a proposal for having bird study in the schools is that the course is already crowded and no room remains for a new study. The objection would be rational if it were proposed to introduce a new study. Birds cannot be studied from books and very few schools have access to mounted specimens. Saturday excursions, observations on the road to and from school, and in country schools even at recess and during school hours will furnish subjects for conversation lessons at odd times and much needed material for language and composition work. In one school I know of, the whole school organized themselves into a club for the study of the birds. They met at 4 o'clock twice a week and compared notes for about twenty minutes. This did not detract from their school work but on the other hand increased the interest in the regular studies.

Bird study should be begun as soon as the child starts to school. The seeming interest of these little tots in their reading and number lessons pales before the glow of wonder and enthusiasm as they tell of finding a bird's nest on the way to school or hear the story of the birds from their teacher. Let a teacher mention finding a sparrow's nest and the school turns into an experience meeting; each little one having a story of its own to tell. In the country school this is especially true, as the pupils have a better chance to observe birds than the children of the cities.

I have had to work out my own plan of bird study in the schools, as I have never chanced to get any one else's plan. I have had some successes and some that were not successes, but from these experiences I have formed a plan that I believe overcomes most of the difficulties.

In primary grades social talks with the pupils is the best method. Let the pupils talk as much as possible. Take a single bird for a lesson and show a picture. The colored photographs from the magazine *Birds and All Nature* are the best I have seen. By a judicious use of questions and statements bring out the distinguishing features of the bird you are studying. I have no patience with the teacher of birds who asks such questions as: How many feet has a bird? What is its body covered with? How many eyes has a bird? What is a bird's nest for? etc. The dull pupil does not learn anything and the bright boy is disgusted. The pupils will tell about the habits, food, nesting places, eggs, call, etc., of the common birds.

If you are studying the Woodpecker, call attention to the peculiarities that distinguish it from other birds. You should consider its stout, sharp bill, its peculiar feet, its short stiff tail feathers, its habit of drumming, and its undulating flight. Tell the story of how the Woodpecker got its red head and black and white dress and have the pupils learn a verse or two from the many that are to be found in the readers and teacher's journals. Before the interest lags close the period, always leaving something for the next time. At the next lesson, if

during the right reason, you will have several facts from pupils who have seen and observed a Woodpecker during the period since the previous lesson. Never fail to treat of the good points of a bird and by a vote have it declared either a "good bird" and worthy of protection or a "bad bird" deserving of extermination. The teacher can mould the opinion of the school in accordance with established facts.

In the grammar and high school grades a different plan works best. Here every pupil should have a note book in which he should record his own observations. These should include the time of arrival, numbers, nesting, food, departure, acts of depredation, value to man, etc. Every note should be dated to be of value. Encourage the pupils to bring specimens to school. In the course of a year the pupils will find several dead birds and capture several alive. Shooting birds for specimens should not be tolerated. Last year we had twenty-two birds brought to school for study. Among those brought alive were the Barn Owl, Coot, Horned Grebe, Meadowlark, Barred Owl, and Flicker. Several different kinds of ducks were brought and a number of dead birds, among them a Black-headed Grosbeak, Golden-crowned Warbler, Bohemian Waxwing, Downy Woodpecker, and American Bittern. I mention these to show the actual possibilities in this line.

At the end of the year we made a table like this:

	NUMBERS	Especially valuable	Nesting	Summer residents	Winter residents	Permanent residents	Migrants	Accidental	AUTHORITY
1. Barred Owl	Rare		X			X			Seen
2. Baltimore Oriole	Common	X	X	X					Seen
3. Ruby-crowned Kinglet	Uncommon				X				Reported
4. Bob-white	Common	X	X			X			Seen
5. Canada Goose	Common						X		Seen
6. Bohemian Waxwing	Common							X	Seen

The table does not need much explanation. A list is made up from the notes of all of the pupils but each marks his own. One pupil will see the Northern Shrike and mark it "seen," while another can only mark it "reported." No bird is put on the list without the approval of the teacher. Last year we had seventy-three birds on our list, and I can answer for every one of them.

Now I believe this to be true bird study and its utility and common sense are its defense. Only fifteen minutes about twice a week was needed to keep the notes and the time was not missed. An interest was aroused and the diversion from regular school work was pleasing. Many pupils report an added pleasure in verifying their notes and observa-

PLATE III

NEST OF THE RUBY-THROATED HUMMINGBIRD

tions during the summer vacation and all voted for a continuation of the study during the present school year.

I have never taught a school where I did not have bird study and I have never heard an objection. It is not a good plan to announce the first day of school that you intend to introduce bird study into the school. Such a course will arouse a storm of opposition. Just start it very gradually after you have the school well under control and no one will suspect an innovation until you have the pupils converted and the patrons realize the value in the added interest of the children in their school work. And remember that bird protection should be the keynote.

The state laws protecting game and song birds should be discussed and better ones proposed. Spring shooting of migrants should be discouraged. Superstitions about birds should be exposed. Errors in popular ideas should be corrected. Prejudices should be overcome but truth must prevail. A love of the birds must not blind one to the fact that some are destructive to the agricultural and horticultural interests of the state. A healthy sentiment in favor of the birds in the schoolroom will down the boy who shoots Meadowlarks just for fun and he will be an outcast until he reforms.

I would urge every member of this Union to think upon this matter and do something to encourage the study of birds in the schools of this state. Our constitution gives this as one of the objects of the Union's existence, and yet as an association I fear we have done very little for the teachers of our public schools. The time is passing rapidly. Every year hundreds of boys and girls are finishing the courses and leaving the schools of Nebraska. They know nothing of the value of our bird fauna and in their strivings to become real men and women they imitate their vices as well as their virtues and join the ranks of bird destroyers, the men for sport and pleasure, the women for decoration. As students of bird life and champions of its protection our duty is plain and if future generations blame us and we attempt an excuse they will mock us by repeating our big words and showing our little deeds. The school is the field and we are responsible for the harvest. What shall it be?

BIRDS AS OBJECTS OF STUDY IN THE GRADES

CHAS. FORDYCE, UNIVERSITY PLACE

[This paper was printed as numbers three and four of a series of pamphlets entitled Nature Study in the Elementary Schools, prepared by Professor Fordyce and issued by the Superintendent of Public Instruction of Lancaster county, dated respectively November and December, 1900, and is not here reprinted.—EDITOR.]

A LATE NEST OF THE RUBY-THROATED HUMMINGBIRD

FRANK H. SHOEMAKER, OMAHA

On the 13th of last July, an ornithological friend mentioned to me the fact that he had found a nest of the Ruby-throated Humming-bird with two young, in the woods near Bellevue, about eight miles from Omaha. He kindly directed me to the nest, and three days later I attempted to find it. My friend had described the location, and stated that I might know the tree by the presence of a nest of the Acadian Flycatcher on one of the lower branches, almost overhanging a wagon road. I missed my directions, however, and failed to find the tree.

On August 19, as I was leaving a shady ravine where I had been watching a vireo, I happened by the merest chance to see a nest of the Humming-bird, placed about eight feet from the ground upon a horizontal branch. I at once recalled my July directions, and went to the opposite side of the tree to look for the Flycatcher's nest, finding it as described. A well-worn road lay not more than twenty feet from the tree. This of course convinced me that the nest was the one for which I had made the unsuccessful search, so I climbed the tree with the intention of cutting off the branch. This I was about to do when I saw to my surprise that the nest contained two eggs. Still supposing it to be the nest which on July 13 had contained two young birds about ready to leave, I was at a loss to understand the circumstance, when I caught sight of another nest on a branch three feet higher. This was weather-beaten and misshapen, and plainly the one described to me; while the nest with eggs, not forty inches from the old nest, was beyond a reasonable doubt a second nesting of the same birds. The second nest was in perfect condition, the lining being soft and thick, and the rims and outer walls covered with sea-green lichens closely bound with an almost invisible mesh of spider webs. Both nests were situated upon the branches about eight feet from the trunk of the tree. I saw neither of the parent birds, though I remained in the immediate vicinity for some time.

To ascertain the date of most common nesting in this latitude, I consulted all available works on ornithology, over twenty in number, embracing such authorities as Audubon, Wilson, Coues, Ridgway, Bendire, Maynard, and Davie, as well as state or local treatises such as those of Oberholser, Hatch, Butler, and Cook, finding the dates to range from May 10 to July 15. In all these works I found but two detailed references to late nests. Mr. Oberholser mentions a nest with eggs found July 24 in Wayne county, Ohio, and Major Bendire speaks of a nest with fresh eggs August 7. I regret to state that no particulars are given concerning the nest last mentioned, as to locality or even latitude. This investigation convinced me, however, that August 19 is an exceptionally late date. The few nests with eggs which have

come under my observation in this region have been found in June. I have also seen several nests in July with young birds.

On August 26 the nest contained a young bird about three days old, the remaining egg apparently being infertile. The little one was far from handsome, with black skin, ragged plumage tracts, stubby bill, and unopened eyes. The mother bird was about the nest, and I saw her feed the young three times, though she was very shy and would not approach the nest while I was near.

My next visit was on September 3. The nestling's eyes were now open, and he had grown rapidly. A little clump of elms stood near, and in this I secreted myself, having thus an excellent place of observation not more than eight feet from the nest. Very soon the mother bird appeared, and after a wary approach alighted upon the edge of the nest and thrust her bill far down the throat of the young bird. I could see her throat move as she regurgitated the food. She left her bill in the little one's throat for about six seconds, then withdrew it. This operation was repeated four times, with intervals of three to six seconds between. She tried to feed it a fifth time, but the young bird would not open its bill, and after several efforts she desisted and flew away. She kept up a continuous chatter while about the nest, except when actually feeding. Her note consisted of two syllables as a rule, though sometimes a single chirp, always of the same pitch and duration, repeated several times in succession; a very simple chirp, fairly clear, but not loud. She commenced this vocal greeting when ten or fifteen feet from the nest, always approaching cautiously, making short dashes and hovering after each. When the little one heard her note or the sound of her wings it was at once on the alert, answering her calls in kind, though much less strongly, and straightening its neck for the expected food. After feeding she came to my place of concealment and hovered not three feet away, making short lateral dashes and viewing me from every side with great agitation, with a continuous chirping. After this inspection she dashed away over the treetops, and did not return for three-quarters of an hour. Upon her return she was too wary to go near the nest, and flew away after again viewing me carefully. In a half hour she came back, first approaching the nest, then coming to my elms, inspecting me several times before her maternal bravery bore her to the edge of the nest. She inserted her bill three times, and again made several attempts to feed the little one after it was satisfied. I remained at the nest fifty minutes after she left, but she did not again return during that time.

During the absence of the mother I frequently examined the young bird quite closely. There was a perceptible swelling under the skin at the base of the neck, due, I assumed, to the frequent feedings. It seemed to have no fear, its leading instinct being to take food. I should mention another instinct, however—its determination to avoid a fall was quite remarkable. Having on this occasion no means of

elevating the camera, I found it necessary to tip the nest quite sharply to obtain a photograph, and at first moved with great caution for fear of upsetting the little one; but I soon became convinced that it would take care of that matter. I removed the infertile egg and gave little further attention to the angle of the nest. I had left the egg thus long for fear the parent bird would resent any change at my hands. Room was becoming valuable with the growth of the little one, however, and with an available space only three-fourths of an inch in diameter and one-half inch deep there was none to spare for the egg. In fact, as the growth of the bird continued, it became to me more and more a matter of wonder that two young hummingbirds can possibly share so small a nest—two being invariably the number of eggs deposited.

I ventured to take the young bird from the nest for the purpose of photographing it upon my finger, to have an adequate means of conveying an idea of its tiny proportions. I bent down the branch and tied it securely, so that I might use both hands; but even then I felt much as a jeweler might if he were to attempt to handle the delicate parts of a watch with his fingers. With an ever-present fear of a fall, the little one clutched the bottom of the nest, and brought away two tufts of the silken lining. It was too young to perch, but clung bravely to my forefinger with a little aid from me in balancing. To my regret, I heard the mother bird's wings the instant I exposed the plate. She dashed wildly about the nest several times looking for her young, then flew away over the treetops. I repaired the rumpled lining with as little delay as possible and replaced the young bird in the nest, with guilty visions of a provoked desertion and a hungry little Hummingbird vainly waiting, then withdrew to a more distant point than usual. I recalled all the picturesquely absurd stories of birds—hummingbirds in particular, as I remembered on this occasion—dropping dead when their nests were discovered; or poisoning themselves and perhaps the whole family if the eggs or young were touched, and spent a very anxious ten minutes trying to assort the true from the false and awaiting developments, when the mother bird returned and promptly resumed her duties.

The little one was very active and bright, frequently turning about in the nest and moving its wings to different positions. Once it stretched its neck straight above the nest to its full extent, and held it so for over a minute.

After office hours on the 7th I started for the nest—a six-mile streetcar ride and a two-mile walk from the end of the line. The young Hummingbird had grown remarkably. I was greatly surprised to find that the feathers of the back, even at so early an age, had a distinctly greenish cast, with the iridescence quite marked. The breast and under parts were whitish and the throat white. The tail had grown perceptibly; the middle feathers were black and the outer feathers broadly tipped with white. There were two distinct touches of white about the eyes,

one above and one below. The feathers had become sufficiently long to cover all parts of the body. The feet and bill were black, the latter having lengthened surprisingly. The bird was still fearless, and after the usual opposition about leaving the nest perched contentedly upon the tip of my finger. It took advantage of this airy position to exercise its wings, which it did time after time, with sufficient rapidity to produce a fairly audible humming sound. When it did this I could feel the tiny feet clutch more closely.

On the 9th I left home at half past ten o'clock with camera and twelve plates, half fearing that the little wings had by this time carried away my subject. I approached the nest ready for such a misfortune, but the young Hummingbird was still in possession, and I hastened to renew my acquaintance. Within the two days since my last visit, however, it had become possessed of another instinct—that of fear. As I touched the branch the bird left the nest and fluttered to the ground ten feet away, dropping lightly upon a bed of molding leaves. I soon had it in my hands, and was delighted to find that it was willing to take up matters where we had dropped them, and during the four hours which I spent at the nest it showed no further signs of fear. The glossy green of the back had become more noticeable, and the black feathers of the tail now had a violet iridescence. I was almost certain that the bill had grown perceptibly within forty-eight hours, in spite of the fact that the ornithologists declare the growth of the bill to be very slow. The feathers had become smoother and presented a fairly mature appearance. The little one had acquired ambitious tendencies, and promptly climbed and fluttered to the highest available perches. When placed at the bottom it clambered many times to the top of my ladder of four fingers. As upon the occasion of my preceding visit, it seemed to enjoy clutching my finger and exercising its wings. It proved an admirable photographic subject, and eleven of the twelve plates which I exposed were successful. One photograph of particular interest shows the young bird with neck stretched to its full extent; the mother bird flew over and the little one prepared to meet her. I had the pleasure of seeing the feeding repeated several times that afternoon.

During all the time I spent at the nest—a total of twelve and one-half hours on five separate days—I did not see the male parent. It seems to have been fully established by observers that the male takes no further interest in the family after the completion of the nest, as a rule; perhaps leaving even that duty to the female in most cases.

On the 8th of September occurred the terrible Galveston storm. On the night of the 10th the storm reached Omaha, and it was quite severe, with strong wind and heavy, cold rain. I thought many times of the little home on the branch in the woods, and wondered whether the little one and the mother could cling to the frail, swaying nest through the long cold night. I shall never know; but dur-

ing my numerous visits at the nest I acquired an interest and a sense of proprietorship which prompt me to hope and feel that the little family found its way safely beyond our borders before the cold frosts set in.

YOUNG ROSE-BREASTED GROSBEAKS

ELIZABETH VAN SANT, OMAHA

The method adopted in studying the young of the Rose-breasted Grosbeak has been to form a close personal acquaintance with individuals of the species. To make this acquaintance more intimate, the young birds have been taken from the nest before they were old enough to recognize their change of surroundings, and have been reared with a number of birds of different species. They have never known the limitations of a cage, being given the liberty of a room specially devoted to the feathered members of the household. A screen door divides their apartment from the adjoining room, and admits of their being observed without putting upon them the restraint of a human presence. No effort has been made to tame or train them, the object being to see what they are, not what they can be made.

When taken from the nest they were about a week old. Their heads and backs were adorned with long white fuzz. The plumage tracts on either side of back and breast were thickly studded with pin-feathers, while great patches of bare skin intervened. Their eyes were open occasionally, but at best were sleepy-looking and unintelligent, while their grotesquely large beaks added to their quaint appearance. They were put into an old nest of the Chat, and for a few days slept most of the time covered with flannel. They displayed marvelous activity at feeding time, standing on their tip-toes, begging loudly and fluttering their wings incessantly. It was droll to see them preen their pin-

feathers with their great clumsy beaks, and it was especially ludicrous to see them bestow as much care upon the patches of bare skin as upon their few feathers. After spending several days in the nest they suddenly became restless, refused to remain covered, and finally clambered over the edge of the nest. They were without exception the most intractable youngsters I ever cared for. Wood thrushes, bluebirds and orioles after leaving the nest were content to sit quietly for many minutes at a time, and would remain on a perch waiting their turn to be fed, fluttering their wings and begging while the others received attention. But the grosbeaks were never still a minute. No sooner would one get a mouthful than he would start off across the room clambering over various objects, or fluttering along the floor, all the while uttering his complaining note. Over and over they would have to be brought back and fed, and only when their stomachs were full would they become more quiet. They had a funny habit of standing face to face, both mouths wide open, each begging the other to feed him. They would also go to the dish which contained shreds of raw meat and eyeing some piece which looked particularly tempting, would open their mouths, flutter their wings and coax it to go in.

Shortly after they had left their nest they showed an unwillingness to be cuddled into it for the night, and as their plumage was still scant I feared they would be cold unless covered while they slept. So a perch was put across a small pasteboard box and the birds put on the perch, and then the top of the box was covered with flannel. Late in the evening I peeped in to see how they were getting along. One of the little birds was still clinging bravely to his perch, but his head was hanging down until his beak touched the bottom of the box fully two inches below the perch. He was rescued from his uncomfortable position and not allowed to attempt that method of sleeping again until he became stronger. They soon showed signs of tucking their heads under their wings while sleeping. One evening one of them was observed asleep with his head very perceptibly turned to one side. The next evening he got so far as to twist his head around until it touched his side, but not until the third evening did he succeed in getting it into a comfortable attitude for sleeping. I had always supposed that this custom of birds was an actual thrusting of the head beneath the wing. But my observations on half-fledged birds first showed me that the wing remains in its natural position and the head is simply laid along the side just above the wing. After the birds are fully fledged the feathers are fluffed about the head, completely concealing it and giving it the appearance of being hidden under the wing. For some time I thought that all the young birds were going to turn their heads to the left side, and was searching diligently for some structural reason for it, when one evening one of the grosbeaks was caught sleeping with his head turned to the right, and from that time they were as apt to sleep with the head turned one way as the other.

After a few days of the restlessness of which I have spoken, the grosbeaks developed a new trait. In the nursery department of the bird room there were at the same time young of the Wood Thrush, Bluebird and Grosbeak. Their various methods of receiving me when I went into the room formed an interesting contrast. All would be clamorously hungry. The wood thrushes would greet the opening of the door by coming with upraised wings as fast as their feet could bring them to meet me, all the while uttering a pretty musical trill, and as soon as they could fly, they would alight upon my shoulders or hands. The bluebirds would remain where they happened to be, but would set up a vociferous appeal, accompanied by a most wonderful whirling motion of the wings. But the grosbeaks, equally hungry, at the first click of the latch straightened themselves into an erect position and remained perfectly rigid until they were touched, and then, like a flash they lost their rigidity and commenced begging as insistently as the others. I frequently tried the expermiment of feeding the other birds and paying no attention to them, to see if they would yield to the temptation, but their instincts were stronger than their appetites. I have observed this same method of concealment in young grosbeaks in the woods.

Another instinct, of which this was a forerunner, was their natural wildness. As soon as they learned to fly they began to grow wild, and long before they could feed and care for themselves they grew afraid and had to be caught and held a few minutes before they would take the food from my hands.

When just thirty days old the male was first heard to warble, and a few days later the female began to sing. Their efforts were by no means the full song of the mature bird. They sang with swelling throats and quivering bodies, but with beaks nearly closed, only occasionally opening them and letting out a louder, stronger note.

The plumage changes of the Grosbeak have formed an interesting study. My observations have been made upon three males and one female. From these observations I learn that the sexes can be distinguished by their plumage upon the first appearance of pin-feathers. This will be before the bird is a week old. In the male the feathers along the inner edge of the wing are pink, while those of the female are buff. The color can be plainly seen through the transparent sheaths of the feathers even before they burst. The wing linings are an exquisite rose color with the first plumage. In each of the three males one or two pink feathers appeared upon the breast with the first plumage. When about six weeks old they began to moit. One of them molted after a fashion peculiarly his own. He lost almost every feather upon his body, although his beautiful wings remained intact. He was a singular looking object, and excited the curiosity of the other birds to such an extent that it became necessary to isolate him until his plumage was in a measure restored. But as if to compensate

PLATE IV

NEST OF THE RUBY-THROATED HUMMINGBIRD

for his woe-begone appearance at this time, his new coat was far more perfect than any of the others acquired. The second plumage contains a very perceptible amount of the rose color on the breast. The basal two-thirds of each feather is rose-colored, while the tip is tan with a darker streak in the center. The result is that the rose color is partly concealed, showing distinctly when the feathers are rumpled or parted. The distinction between the sexes became evident in the other plumage as well as that of the breast. Patches of black and white appeared on the wing and back of the male, while the lower half of the breast and belly were whitish. The female remained brown, with the entire breast thickly streaked with darker. Both sexes retained the stripes on the head.

The character of the feathers varies in the different species I have had under close observation. The feathers of the Grosbeak and Wood Thrush are peculiarly brittle, and the wing and tail feathers are easily broken. The plumage of the Grosbeak lacks the soft and smooth appearance that some of the others possess. The Orioles and Bluebirds are much trimmer in appearance, and the feathers of the wings and tail seem stronger and tougher and are seldom broken.

The beaks of the grosbeaks in infancy were also very brittle, and on several occasions the tips of the upper mandibles were broken off, and bled considerably. Afterwards new tips grew on, though a notch which appeared some months later in one of the beaks still remains. None of the other birds raised in captivity ever were troubled in this way, although all had beaks much more slender and apparently more delicate than those of the grosbeaks.

As occupants of the bird room the grosbeaks possess many interesting characteristics. They are extremely sociable, being almost invariably seen together. When one feeds, the other feeds; when one bathes, the other bathes; they generally sleep on the same branch at night, and follow each other about the room in the daytime, although they pay little attention to the other birds. They are not very airy upon the wing, and are decidedly awkward on their feet. When they hop from one end of the window sill to the other it sounds as if they were shod with wooden shoes. They are extremely suspicious of anything new, and will eye it closely, turning the head from side to side, with the body poised ready to retreat precipitately at a moment's notice. They occasionally venture to take food from my hands, but always snatch it and fly as though they had done it at the risk of their lives. They show no signs of wildness when I am in the room, so long as I do not attempt to touch them. When caught in the hand they do not seem alarmed as do some of the birds, but simply watch their chance to seize a finger with their strong beaks. I wish it were possible to give each of you a demonstration of the power of their beaks. They seem to know just how to select the most sensitive places upon the hand, and their method of holding on and chewing is truly scientific. But strange

as it may seem, although possessed of so powerful a weapon of defense, they never use it in their disagreements with the other birds. The limit to which they seem to go in quarreling is to open the beak threateningly and complain loudly. I have never seen them make an effort to bite one of the other birds. The orioles, on the other hand, use their bills promptly and effectively in an altercation, and the wood thrushes will defend themselves when cornered by striking with their beaks.

The Grosbeak prefers seed as a regular diet, but he will leave his seed cup any day for a piece of fresh meat or a meal worm, and in fact eats freely of the soft foods provided for the insect eating birds. They are the heartiest eaters in the bird room, standing for many minutes beside the food dishes, while the other birds are content with one or two mouthfuls at a time.

They are full of amusing pranks, still retaining many of their comical baby ways. While they could probably have been tamed and made more companionable, their independence and individuality have made them all the more interesting as a study.

NOTES ON THE BREEDING OF THE PROTHONOTARY WARBLER

M. A. CARRIKER, JR., NEBRASKA CITY

A mile southeast of Hamburg, Iowa, the Nishnabotna River breaks through the chain of bluffs which skirt the Missouri River on the east side, and before the advent of the Chicago, Burlington & Quincy Railway, wound along down the bottom for about thirty miles, finally emptying into the Missouri River ten miles due south of Rockport, Missouri. It gave the railroad company so much trouble by washing out their track that they finally cut a new channel direct to the river, so that it now empties into the Missouri River a short distance above Peru, Nebraska. This left about twenty-five miles of the old bed of the river filled with water and in communication with the Missouri. Its mouth has gradually filled up until now the Missouri has access only during high water. As a result this forms one of the best natural fishing resorts for many miles around, being richly stocked with croppie, perch, buffalo, German carp, sunfish and bullhead. The channel has gradually grown wider until many of the willows lining its banks are now decaying stubs, standing in the water, and forming nesting sites for numerous chickadees, flickers, red-headed, hairy, and downy woodpeckers.

With the many deserted holes for nesting sites and the thick groves of cottonwood, elm, maple and willow trees lining the banks, for feeding grounds, we have a perfect summer haunt for one of the most beautiful and interesting warblers, the Prothonotary. It arrives as near as I can tell about the last week in April, but being in that locality only at infrequent intervals, I have no knowledge as to the

exact time when nest building begins, how long a time the bird consumes in this work, etc. That the birds do not all deposit eggs at the same time is evident from the fact that nearly fresh eggs and young of various ages were found on the same day.

For two seasons I had noticed the birds in that locality and in the spring of 1900 I resolved to locate a nest if possible. With this end in view I went down as soon as school closed at the State University.

The second day after my arrival, June 5, while sitting on the bank of the stream idly watching my float, a Prothonotary Warbler alighted on a stub standing in the water about twenty feet from the bank where I sat. I was all attention in a second, and as it clung for a moment to the edge of an old hole in the stub, I saw that it held a worm in its bill. Then the slender bill of the female appeared at the opening, followed by the beautiful golden head. After uttering a few purring notes the male gently put the worm in its mate's mouth and then flew to the grove on the opposite side of the stream, into which it disappeared. Keeping myself well hidden I watched for perhaps twenty minutes, during which time the male came four times with a worm for the incubating female. When I approached the nest, the female flushed as the boat grazed the stub. She flew into the grove opposite and I did not see her again until an hour afterward as I was passing, when both birds were clinging to the stub, but flew away at the approach of the boat. The large nest cavity was half filled with twigs and decaying shreds of bark and leaves, while the top of the mass was hollowed out and lined with fine bark shreds to form a receptacle for the eggs. Owing to the fact that the stub stood in the water and the nest was only a short distance above it, the nest materials were quite damp and much decayed. The nest contained six almost fresh eggs with a pure white ground color and profusely spotted and specked with reddish lilac. The eggs measure, respectively, .70x.55; .75x.57; .74x.57; .73x.56; .78x.56. Farther down stream two nests were located by watching the birds as they carried food to the occupants, which in these cases proved to be young birds instead of the incubating female as in the first instance. These nests were in stubs standing in deep water but the holes were six and eight feet respectively above its surface. I did not ascertain the number of young in the nests, not wishing to break open the holes and expose the young.

One thing about the action of the parent birds was strange to me and wholly different from anything I had ever noticed before in regard to the actions of warblers when their young were disturbed or in danger. If one of the birds happened to be present when the nest was disturbed or even approached, it merely flew away without any of the usual manifestations of alarm so common among birds and did not return until the intruder had disappeared. As a general rule the birds are shy, occasionally appearing singly on the outskirts of a grove and before you are fully aware of its presence, it has flashed away through

the trees like a sunbeam. Again you will be startled by a little burst of song from a thicket close by; but you will have to look closely and with great care before you are able to detect its author as he sways on a slender limb near the ground. The song consists of a series of single syllables, delivered in rapid succession, starting in loud and clear, but gradually running together towards the end and much resembling *tsweet, tsweet, sweet-sweet-sweet.*

Their food seems to consist largely of caterpillars, which they must get almost exclusively from the trees, since they are very seldom seen feeding on the ground. As long as food is plentiful and the weather favorable they remain with us, but gradually drift southward when conditions are unfavorable. My last trip to their locality was made September 3, when I saw several birds. How long they remained after this I do not know. Careful observation will yield much that is interesting concerning this bird. As far as I have observed its nesting habits here, they agree quite closely with those described for the species on the Illinois River, Illinois, as published by W. E. Loucks. It has been found breeding near Omaha and on both sides of the Missouri River as far north as the middle of the state, but never so commonly as in the locality which I have described.

OBSERVATIONS ON TRAILL'S FLYCATCHER

M. A. CARRIKER, JR., NEBRASKA CITY

This shy little denizen of the Missouri River willow swamps was entirely unknown to me until 1897, when on July 19 I made its acquaintance. I had gone fishing to what is known as the "Slough," across the river from Nebraska City. This is a body of water in the form of a half horseshoe, lying along the east side of what was formerly the bed of the Missouri River. It is about three miles long and from twenty-five to one hundred yards in width, the lower end being connected with the river during high water. On the east side the land is high and dry, while the strip on the west side between it and the river is low and marshy and covered with a thick growth of swamp willows from three to fifteen feet in height according to the amount of moisture in the soil. Small sloughs and ponds are scattered about, and altogether it forms a most excellent feeding and breeding ground for many of our marsh birds.

The fish having ceased to find anything of interest in my most carefully prepared bait, I gave up in despair and started out on a rummage among the thick willows bordering the stream. It was not long before I was attracted by a bird song, seemingly a mixture of that of the Phœbe and Wood Pewee, yet differing from both. It being new to me I made every possible effort to get a glimpse of the bird. I was just

starting on again when I saw a nest which had escaped my notice in the search for the bird, and which I took for that of the Yellow Warbler. However, upon examination it proved to be somewhat of a surprise, since it was entirely new to me. It was in an upright crotch of a small willow, about five feet from the graund, and the spot where the tree grew was entirely surrounded by water about a foot deep, leaving a small island perhaps five feet in diameter.

This nest was made of gray and brown bark fibers quite compactly woven together, and lined smoothly with fine bleached grass stems, and contained four of the most beautiful eggs I think I have ever seen. They were about the size of the Wood Pewee's egg, only more slender The rich creamy background was profusely blotched and dotted with bright chestnut, one egg having the entire side covered by a blotch. Much to my regret I was unable to blow them, the incubation being too far advanced, but they were identified as being those of Traill's Flycatcher. This must have been a second set for I found slightly incubated eggs the next year on June 11.

This second nest was found not far from the one of the previous year. I was slowly picking my way through the thick willows in water nearly knee deep when I caught a momentary glimpse of a little gray bird as it flashed up about fifteen feet ahead and disappeared among the willows. A second later I saw the nest from which it had been flushed and at once recognized it as that of Traill's Flycatcher. It was just seven feet above the surface of the water. The nest was almost identical with the one found the previous year, the same materials and construction being present, and I have since found it to be prevalent with the species in that locality. This nest contained three nearly fresh eggs, which had the same creamy background and chestnut markings, except that the markings were confined to dots and specks over the surface instead of the blotches. The female soon returned and I secured her, thus making the identification positive. Although I searched diligently I found no more nests that summer, but during the summer of 1899 I was rewarded by securing two sets, one of four eggs and the other of three, which may have been an incomplete set since the eggs were fresh and the female absent from the nest. These nests were found June 17, and in the same general locality as the previous ones.

The first was located at the edge of a small pond, where the willows were about two inches in diameter and from fifteen to twenty feet in height, and growing so closely as to make a passage between them difficult. The nest was five feet from the ground and supported on the side of a main trunk by two small twigs. It was typical in material and construction. The second was in an entirely different situation, yet it cannot be said to form an exception to the general type of locality chosen. In this instance there was a small area of ground perhaps two feet above the surface of the slough, which it bordered, and overgrown

with shrubby willows, while the ground beneath was covered by a thick growth of swamp grass and sedges. In an upright crotch of a willow slightly larger than the rest and about four feet from the ground was placed the nest. Again we have the typical construction and material; in fact I know of no other small bird in which there is so little variation in size, material and construction of the nest. The three fresh eggs were marked slightly heavier than those found a few hours before, and were smaller in size.

After looking in vain for two years for a heavily marked set similar to those found in 1897, I have come to the conclusion that this is not the typical marking of the egg and that those that were so beautiful by reason of the heavy markings were abnormal eggs, the parallel of which I fear I may never again have the good fortune to find.

After describing the nesting site of this little flycatcher it is hardly necessary to add that it is extremely shy and retiring in its habits, and very easily escapes the notice of even the experienced collector.

I am informed by J. S. Hunter, of Lincoln, that in that vicinity it frequents hedges along country roads, while Dr. Wolcott reports that in Michigan its relative, the Alder Flycatcher, is partial to alder thickets of meadow lands and along the creeks. This seems to indicate that the species is exceedingly versatile in its breeding habits, easily becoming accustomed to the various conditions in which it may find itself.

BREEDING HABITS OF BELL'S VIREO (*VIREO BELLII*)

MERRITT CARY, NELIGH

This timid recluse of the shrubbery is found only in the central and southwestern plains region of the United States, its range extending eastward to Iowa and Illinois, northward to southwestern Minnesota and the Dakotas, and thence southwestward to Mexico. Perhaps in no other situation is this bird so much at home as in the plum and choke-cherry thickets in the canyons of our western Sand Hills.

Bell's Vireo arrives from the south late in May, just as the rearguard of the warbler host is leaving for the north. In four or five days the birds have arrived in force and almost immediately spread out over the country in search of suitable shrubbery for nesting sites; the denser the thicket the better it seeming to suit their tastes. Frequently two or three pairs will select the same patch of plum brush for their summer residence, especially if it covers considerable area; in fact, I have in one instance found nests of this species not more than ten feet apart. But in small thickets of plum and choke-cherry one pair usually has its abode, the male pugnaciously driving off all intruders of the same species.

The nest is a neat affair, usually hung by the bird from an upright

crotch on a plum branch about half way between the tip and the main trunk. The average height of the nests I have examined is about three feet and a half, though I have several times found nests of this species hung from a crotch on a horizontal branch within a foot and a half of the ground, much lower, in fact, than the tops of the weeds which closely surround it. They are as a rule thick-walled, deeply-cupped structures composed mainly of weed fibers, dry leaves and fine strips of the inner bark of trees, firmly woven together. The lining is of fine grass and rootlets. Nests examined average about two and a quarter inches in width by two and one-half inches in depth, outside diameter, and one inch and five-eighths in width by one inch and three-fourths in depth, inside diameter. It is thus seen that they are a little deeper in proportion to their width than are nests of other species of Vireos.

The eggs, laid the first or second week in June, are generally four, of a creamy-white ground color, sparingly speckled with small dark red spots, especially towards the larger end; these interspersed with small lavender shell markings. Eggs vary a great deal in regard to the amount of speckling but as a rule have smaller and fewer spots than is the case with those of other Vireos. In a set of five from Texas belonging to Mr. M. A. Carriker, Jr., the reddish speckling is reduced to a minimum, what few spots there are being very minute. One of the eggs of this set was especially interesting, being entirely immaculate.

The Bell's Vireo is shy and retiring in the extreme, being very seldom observed unless especially sought after. Even then the glimpse is but momentary, as it is a very restless little body and on the move nearly all the time. Adding to this lively disposition the dull colors of the bird it is not strange that it is seldom observed. Furthermore, the Vireo rarely appears on the edge of the thicket but keeps back well within the shadows so that even the momentary glimpse is unsatisfactory. Bell's Vireo is seen to the best advantage in the early days of September just previous to its departure for the south. At that time it keeps company with the Red-eyed and Warbling Vireos in the cottonwoods and willows along streams.

I know of no sounds with which I can correctly compare the song of this bird and it is certainly beyond the power of words to describe it. Speaking in a general way it is a peculiar jumble of odd notes, given in a quaint manner. Once heard it cannot be confounded with any other bird song. When strolling around plum patches in June I have frequently been accosted from the depths of the thicket by sounds which greatly resemble the word "p-r-a-i-g-h" given forth with great vehemence and rapidity. After close watching I find the source of these noises to be a Bell's Vireo, and the nest is usually found in the same thicket. These notes I have also heard in July and August, so it is doubtless an alarm note used in all cases of excitement.

My observations on the habits of this bird have not been restricted to the vicinity of Neligh. I have also observed it closely at Long Pine,

in Brown County, Nebraska, where choke-cherry patches in the canyons are favored nesting sites.

Taken altogether the habits of this shy bird are extremely interesting. Doubtless many other facts concerning its life history can be brought to light upon more thorough investigation.

NOTES REGARDING A CHIMNEY SWIFT TREE

I. S. TROSTLER, OMAHA

The subject of the accompanying photograph (Frontispiece) is a hollow bass-wood stub which stood for many years one and one-half miles north of Bellevue, Nebraska, and about sixty yards from the Burlington and Missouri River Railway track near the Missouri River.

This tree was occupied for two successive years by a pair of Chimney Swifts (*Chætura pelagica*). June 8, 1897, a set of six eggs, one of which lay at the bottom of the cavity in the tree, was found, and June 28, 1898, a set of five eggs was found by Roy Mullen and J. E. Wallace.

The swifts that occupied this tree were probably from a colony that had formerly occupied a large chimney some two and one-half miles northward, which was taken down in 1896. In 1899 this tree was cut down.

BIRDS THAT NEST IN NEBRASKA

LAWRENCE BRUNER, LINCOLN

The place where a bird builds its nest and rears its young is just as surely home to it as is the place of our childhood to us. This being true Nebraska is the home of a relatively large number of distinct species of varied habits. Up to the present time we have definite records of the nesting of 203 species and sub-species, and a list of 40 others that are very probable nesters, while there are 60 others which possibly occasionally breed within the state.

A discussion of the reasons for so large a list of birds nesting within the state would be interesting here, but would require a little more space and time than can be given for such an elucidation. The high altitude of western and northwestern Nebraska will partially explain the subject. It will be seen that, on account of its central location, the elevated nature of the western portion, and the varied surface configuration of the state as a whole that what is affirmed above must be true.

From the standpoint of a bird, then, Nebraska is not so bad a state in which to live, although from the following accounts it will be seen that many species of these creatures can not be overly particular as to

PLATE V

YOUNG ROSE-BREASTED GROSBEAKS
About ten days old. July 2.

exactly what should constitute a home. Some of the places where we may look for these homes that are established for the time are the following: A hollow depression in the ground among the dreary Sand Hills or barren Bad Lands, in reeking bogs, miry swamps or on the rolling prairies; a deep crevice between the rocks of perpendicular cliffs in the northwestern part of the state. It may be on the other hand a neat little nest placed in the deep recesses of the shady wood or in the deserted burrow of a prairie dog or some other mammal; or perhaps the home may be established within or upon the decayed trunk of a fallen tree, or it might be that even a worn out boot or an old tomato can has furnished the required location. Other birds may be equally well satisfied with the top of a fence post or a secure spot in an old brush pile, while the bare ground at the foot of some monarch of the forest or even a nook about the barn or house, as well as a cross-beam beneath a bridge, will suit the tastes of certain species. Still others of our birds find secure resting places for their nests in the forks of a branch or limb, or it may be at the tip of a slender twig far out on the end of a swinging branch. Again some of our birds prefer to conceal their homes in a low bush or tuft of grass or a delicate bower of ferns, as will likewise a shelving rock provide the necessary home for still others. Even the chimneys of our own abodes are made the resting places for homes of certain birds, as are also the sides of barns and houses beneath the sheltered eaves, and a hundred other localities which are regularly selected by these creatures when establishing homes for themselves.

Whether the home or nest is a scooped-out depression in, to us, an uninviting mud flat, a floating home among the bullrushes or a neatly woven basket hung to a swinging reed; whether it is an adobe structure plastered upon the face of an overhanging cliff or under the eaves of a barn it is just the same to these creatures.

The nesting of so many distinct kinds of birds within a prescribed region is very significant since it is during the growth of the young birds that a large amount of very highly nutritious food is required. From the standpoint of the farmer and fruit-grower this fact is of the utmost importance, since most young birds are fed almost entirely on an insect diet during the time spent in the nest and for a short time afterwards. The same can also be said of many of the birds that leave the nest as soon as hatched. Therefore, during the growth of the young birds the quantity of such food which is gathered by the parent birds over the entire state must be relatively enormous. Taking as a basis for our estimations the figures given in my leaflet entitled A Plea for the Protection of Our Birds we would have about 75,000,000 birds or approximately 35,000,000 to 40,000,000 pairs that nest here. Should each pair of this large number rear four young there would be required a sufficient food supply for from 140,000,000 to 160,000,000 young birds. If, as we suggested in that paper, a single bird requires on an average

25 insects per day, the enormous number of four billions of insects or 35,000 bushels of 120,000 insects would be required during each day to feed the young birds alone. But young birds need much more food than do old ones and we should at least double this quantity for the young birds. Then to this must be added that required by the parent birds themselves while taking care of the young, making a grand total of 86,000 bushels or 107 car loads of 20 tons each, provided we allow 50 pounds as the weight of a bushel.

Some of these birds are exceedingly numerous in individuals, while others are comparatively rare. Some exhibit greater, while others show less ingenuity in the building of their nests. Some are naturally protected by coloration, while others purposely take great precaution in hiding their homes. Taking all in all, the assignment to their particular places among those that are occupied by different birds while rearing their young depends greatly on their food habits and bodily structure described in another paper.

The following lists will in a measure indicate the comparative abundance and distribution of our native Nebraska birds:

I.—A LIST OF THE VARIOUS BIRDS THAT HAVE ACTUALLY BEEN FOUND BREEDING WITHIN THE STATE, TOGETHER WITH SOME BRIEF NOTES CONCERNING THEIR OCCURRENCE

3. *Colymbus auritus* Linn.—Horned Grebe. Cherry Co., in alkali lakes (Bates, Trostler), not rare.
4. *Colymbus nigricollis californicus* (Heerm.).—American Eared Grebe. Near Omaha (I. S. Trostler); Cherry Co. (J. S. Hunter), not common.
6. *Podilymbus podiceps* (Linn.).—Pied-billed Grebe; Helldiver; Dabchick. Common over state.
54. *Larus delawarensis* Ord. Ring-billed Gull. Cherry Co. (J. M. Bates).
69. *Sterna forsteri* Nutt.—Forster's Tern. Swan Lake (L. Bruner); Cherry Co. (J. M. Bates), not common.
74. *Sterna antillarum* (Less.).—Least Tern. Near Omaha (L. Skow).
77. *Hydrochelidon nigra surinamensis* (Gmel.).—Black Tern. North and central part of state, common.
129. *Merganser americanus* (Cass.). American Merganser. Cherry Co. (J. M. Bates); West Point (L. Bruner).
131. *Lophodytes cucullatus* (Linn.).—Hooded Merganser. Cherry Co. (J. M. Bates).
132. *Anas boschas* Linn.—Mallard. Not uncommon over state in suitable places.
135. *Chaulelasmus streperus* (Linn.).—Gadwall. Holt Co. (L. Bruner).
137. *Mareca americana* (Gmel.). Baldpate; American Widgeon. Cherry Co. (J. M. Bates).
140. *Querquedula discors* (Linn.).—Blue-winged Teal. Common over the state (numerous records).
142. *Spatula clypeata* (Linn.). Shoveller Duck. Common over the state (numerous records).

143. *Dafila acuta* (Linn.).—Pintail; Sprigtail. Cherry Co. (J. M. Bates).

144. *Aix sponsa* (Linn.).—Wood Duck; Summer Duck. Suitable localities over eastern half of state (several records).

146. *Aythya americana* (Eyt.).—Red-head Duck. Cherry Co. (J. M. Bates).

147. *Aythya vallisneria* (Wils.).—Canvas-back Duck. Cherry Co. (J. M. Bates).

172. *Branta canadensis* (Linn.).—Canada Goose. Occasionally on larger streams, northward.

180. *Olor columbianus* (Ord).—Whistling Swan. Swans used to nest on several of the lakes in the Sand-hill Region; but which one, if not both, were thus noted cannot now be determined.

181. *Olor buccinator* (Rich.).—Trumpeter Swan. See note under 180. "Used to breed on Watt's Lake, 25 miles south of Valentine, when the ranches were new and few; also on Swan Lake, at the head of the Little Blue" (J. M. Bates).

190. *Botaurus lentiginosus* (Montag.).—Bittern; Thunder Pumper. An irregular nester over most of state (several records).

191. *Ardetta exilis* (Gmelin).—Least Bittern. Common breeder in eastern Nebraska (several records).

194. *Ardea herodias* Linn.—Great Blue Heron. Common along larger streams (various observers).

197. *Ardea candidissima* Gmelin.—Snowy Heron; Little White Egret. Oak Creek, near Lincoln, 1895 (August Eiche).

200. *Ardea cærulea* Linn.—Little Blue Heron. Thirty miles north of Omaha (I. S. Trostler).

201. *Ardea virescens* (Linn.).—Green Heron; Poke. A common breeder in the state.

202. *Nycticorax nycticorax navius* (Bodd.).—Black-crowned Night Heron. Omaha (L. Skow); Lincoln (J. S. Hunter); Neligh (M. Cary).

206. *Grus mexicana* (Müll.).—Sandhill Crane. A common breeder in portions of Sand-hill Region (L. Bruner, J. M. Bates).

208. *Rallus elegans* Aud.—King Rail. Omaha (L. Skow, I. S. Trostler).

214. *Porzana carolina* (Linn.).—Sora Rail; Carolina Rail. An abundant breeder in the state.

219. *Gallinula galeata* (Licht.).—Florida Gallinule. Omaha (L. Skow); breeds in June (I. S. Trostler).

221. *Fulica americana* Gmelin.—Coot; Mud Hen. Breeds generally over state where conditions are favorable.

224. *Steganopus tricolor* (Vieill.).—Wilson's Phalarope. Cherry Co. (J. M. Bates, I. S. Trostler).

228. *Philohela minor* (Gmelin).—American Woodcock. West Point (L. Bruner); Omaha (L. Skow).

254. *Totanus melanoleucus* (Gmel.).—Greater Yellow-legs. Holt Co. (L. Bruner); Peru (G. A. Coleman).

255. *Totanus flavipes* (Gmel.).—Yellow-legs. Cherry Co. (J. M. Bates).

256. *Helodromas solitarius* (Wils.).—Solitary Sandpiper. Cherry Co. (J. M. Bates).

258*a*. *Symphemia semipalmata inornata* Brewster.—Western Willet. Holt Co. (L. Bruner); Cherry Co. (J. M. Bates).

261. *Bartramia longicauda* (Bechst.).—Bartramian Sandpiper; Field Plover. Over entire state, common.

263. *Actitis macularia* (Linn.).—Spotted Sandpiper. Found breeding over greater part of eastern half of state (various records).

264. *Numenius longirostris* Wils. Long-billed Curlew. Fairly common in Sand-hill Region of state (Bruner, Bates).

273. *Ægialitis vocifera* (Linn.).—Killdeer. A common breeder.

277*a*. *Ægialitis meloda circumcincta* Ridgw. -Belted Piping Plover. Cherry Co., June, 1900 (J. S. Hunter); Dannebrog, 1899, 1900 (G. P. Anderson).

289. *Colinus virginianus* (Linn.). Bob-white; Quail. An abundant breeder throughout the state.

300. *Bonasa umbellus* (Linn.).—Ruffed Grouse. Rockport (L. Skow).

305. *Tympanuchus americanus* (Riech.). –Prairie Hen; Pinnated Grouse. Quite general over the state.

307. *Tympanuchus pallidicinctus* Ridgw. Lesser Prairie Hen. Cherry Co. (J. M. Bates). This bird was formerly much more plentiful than at present (L. Bruner).

308*b*. *Pediocœtes phasianellus campestris* Ridgw. -Prairie or Common Sharp-tailed Grouse. A very common breeder in the Sand Hills and northwestward.

310. *Meleagris gallopavo fera* (Vieill.).—Wild Turkey. Formerly quite abundant along the wooded streams, but now almost or quite extinct in state.

316. *Zenaidura macroura* (Linn.).—Mourning Dove; Carolina Dove; Turtle Dove. Common over entire state.

325. *Cathartes aura* (Linn.).—Turkey Vulture; Turkey Buzzard. A not uncommon summer resident and breeder (various records).

327. *Elanoides forficatus* (Linn.). Swallow-tailed Kite. Rockport (L. Skow); near Greenwood, August, 1896 (August Eiche).

331. *Circus hudsonius* (Linn.).—Marsh Hawk. Breeds generally over the state.

332. *Accipiter velox* (Wils.).—Sharp-shinned Hawk. Sioux Co., May 30, 1900 (J. S. Hunter); Nebraska City (M. A. Carriker, Jr.).

333. *Accipiter cooperi* (Bonap.).—Cooper's Hawk. Breeds quite generally over the state.

337. *Buteo borealis* (Gmel.).—Red-tailed Hawk. Eastern half of state, common.

337*a*. *Buteo borealis krideri* Hoopes.—Krider's Hawk. Sioux Co. (Cary, Crawford, Hunter).

339. *Buteo lineatus* (Gmel.). Red-shouldered Hawk. Omaha (L. Skow); Steven's Creek, near Cheney, May 3 (J. S. Hunter); Nebraska City (M. A. Carriker, Jr.).

342. *Buteo swainsoni* Bonap. Swainson's Hawk. Quite general over the state. Migrates in flocks.

343. *Buteo platypterus* (Vieill.). Broad-winged Hawk. A common breeder along the Missouri River in eastern Nebraska.

348. *Archibuteo ferrugineus* (Licht.). Ferruginous Rough-leg; Ferruginous Buzzard. Nests on hillsides and rock ledges from middle Nebraska westward, not rare.

349. *Aquila chrysaetos* (Linn.). Golden Eagle. Sioux Co., Scott's Bluff, etc., not rare.

352. *Haliaetus leucocephalus* (Linn.). Bald Eagle; White-headed Eagle. Rockford (A. S. Pearse); Cherry Co. (J. M. Bates).

360. *Falco sparverius* Linn.—American Sparrow Hawk. A general breeder in wooded portions of the state, and in canyons in the northwest, where it builds in clefts in rocks.

364. *Pandion haliaetus carolinensis* (Gmel.).—Osprey; Fish Hawk. Rockport, Florence (L. Bruner).

365. *Strix pratincola* Bonap.—American Barn Owl; Monkey-faced Owl. A number of records of the nesting of this owl within the state are at hand.

366. *Asio wilsonianus* (Less.).—American Long-eared Owl. A common breeder in state (numerous records).

367. *Asio accipitrinus* (Pall.).—Short-eared Owl. Dodge Co., on ground in April (L. Bruner); Lincoln (R. E. Preston).

368. *Syrnium nebulosum* (Forst.).—Barred Owl. Breeds over state wherever large trees are found.

372. *Nyctale acadica* (Gmel.).—Saw-whet Owl. Nebraska City (Hershey and Reed by Carriker).

373. *Megascops asio* (Linn.).—Screech Owl. Quite a common breeder over the state.

375. *Bubo virginianus* (Gmel.).—Great Horned Owl. A fairly common nester in Nebraska (several records).

378. *Speotyta cunicularia hypogæa* (Bonap.).—Burrowing Owl. A very common owl in portions of the state where it is resident and breeds.

382. *Conurus carolinensis* (Linn.).—Carolina Paroquet. Formerly quite abundant, but now absent from state. Hayden reported it along the Missouri to mouth of the Platte.

387. *Coccyzus americanus* (Linn.).—Yellow-billed Cuckoo. A common nester in the state, reported by all the bird lovers.

388. *Coccyzus erythrophthalmus* (Wils.).—Black-billed Cuckoo. Breeds over the state, but less common than the preceding.

390. *Ceryle alcyon* (Linn.).—Belted Kingfisher. Thoughout the state in suitable localities.

393. *Dryobates villosus* (Linn.).—Hairy Woodpecker. Throughout the state (a number of records).

393*c*. *Dryobates villosus hyloscopus* (Cab.).—Cabanis's Woodpecker. Breeds in Sioux Co. (Bruner, Wolcott, Hunter); northwestern Nebraska, common (Dr. Agersborg).

394*c*. *Dryobates pubescens medianus* (Swainson).—Downy Woodpecker. Over entire state, eastward, common.

394*b*. *Dryobates pubescens homorus* (Caban.).—Batchelder's Woodpecker. Sioux Co. (Bruner, Hunter, Wolcott).

402. *Sphyrapicus varius* (Linn.).—Yellow-bellied Woodpecker; Yellow-bellied Sap-sucker. West Point (L. Bruner, J. C. Crawford, Jr.); Omaha (I. S. Trostler).

406. *Melanerpes erythrocephalus* (Linn.).—Red-headed Woodpecker. Over the entire state.

408. *Melanerpes torquatus* (Wils.).—Lewis's Woodpecker. Long Pine (J. M. Bates); Sioux Co. (Cary, Crawford, Hunter).

409. *Melanerpes carolinus* (Linn.).—Red-bellied Woodpecker. Nebraska City (M. A. Carriker, Jr.).

412. *Colaptes auratus luteus* Bangs.—Flicker; Yellow-shafted Flicker. A very common breeder in state, especially eastward.

413. *Colaptes cafer collaris* (Vigors). Red-shafted Flicker. Cherry Co. (J. M. Bates); Sioux Co. (Bruner, Cary, Crawford, Hunter).

417. *Antrostomus vociferus* (Wils.).—Whippoorwill. Eastern half of state (a number of records).

418. *Phalaenoptilus nuttalii* (Aud.).—Poorwill. Entire state, but more common northward and westward.

420. *Chordeiles virginianus* (Gmel.).—Nighthawk. East of the 100th meridian, quite common, and possibly also westward.

420*a*. *Chordeiles virginianus henryi* (Cass.).—Western Nighthawk. Quite common in the Sand-hill Region and westward.

423. *Chaetura pelagica* (Linn.).—Chimney Swift. A common breeder in eastern Nebraska.

425. *Aeronautes melanoleucus* (Baird.). White-throated Rock Swift. Pine Ridge of Dawes and Sioux Cos., quite plentiful (L. Bruner).

428. *Trochilus colubris* Linn.—Ruby-throated Hummingbird. A not uncommon breeder in eastern Nebraska (a number of records).

444. *Tyrannus tyrannus* (Linn.).—Kingbird; Bee-bird. Common over the entire state.

447. *Tyrannus verticalis* Say.—Arkansas Flycatcher. Most common westward, but over greater part of state.

452. *Myiarchus crinitus* (Linn.).—Great-crested Flycatcher. Occurs as a breeder over most of state.

456. *Sayornis phœbe* (Lath.). Phœbe; Pewee. Quite common in Nebraska eastward, less numerous westward.

457. *Sayornis saya* (Bonap.).—Say's Phœbe. A rather common bird in western Nebraska where it sometimes nests about houses.

461. *Contopus virens* (Linn.).—Wood Pewee. Omaha (L. Skow, I. S. Trostler); Peru (G. A. Coleman).

465. *Empidonax virescens* (Vieill.).—Green-crested Flycatcher; Acadian Flycatcher. Omaha (L. Skow, I. S. Trostler).

466*a*. *Empidonax traillii* (Aud.).—Traill's Flycatcher. Omaha (Skow, Trostler).

467. *Empidonax minimus* Baird. Least Flycatcher. Occasionally in northeastern part of state (Aughey); Omaha (L. Skow).

474*a*. *Otocoris alpestris leucolaema* (Coues).—Pallid Horned Lark; White-throated Horned Lark. Cherry Co. (J. M. Bates).

474*b*. *Otocoris alpestris praticola* Hensh. Prairie Horned Lark. Eastern and middle portions of state, common.

474*c*. *Otocoris alpestris arenicola* Hensh.—Desert Horned Lake. Cherry Co. (J. M. Bates); Sioux Co. (L. Bruner).

475. *Pica pica hudsonica* (Sab.).—American Magpie. Cherry Co. (J. M. Bates); Sioux Co. (L. Bruner, Cary, Crawford and Hunter). Originally as far east as the mouth of Platte.

477. *Cyanocitta cristata* (Linn.). Blue Jay. Entire state and becoming more numerous than formerly.

488. *Corvus americanus* Aud. Common Crow. State at large, becoming more numerous year after year.

494. *Dolichonyx oryzivorus* (Linn.).—Bobolink. Sand-hill Region, where it is very common on low, wet meadows.

495. *Molothrus ater* (Bodd.).—Cowbird. Throughout the state, quite common.

497. *Xanthocephalus xanthocephalus* (Bonap.).—Yellow-headed Blackbird. A common summer resident and breeder in Nebraska, but more frequent northward.

498. *Agelaius phœniceus* (Linn.).—Red-winged Blackbird. Breeds throughout the state where it is very numerous.

501*a*. *Sturnella magna neglecta* (Aud.).—Western Meadowlark. Throughout the state, but most abundant in central and western portions.

506. *Icterus spurius* (Linn.).—Orchard Oriole. Moderately common as a breeder within the state.

507. *Icterus galbula* (Linn.).—Baltimore Oriole. A very common breeder in the state, especially eastward, although not absent from the western portions.

508. *Icterus bullocki* (Swains.).—Bullock's Oriole. Ft. Robinson (L. Bruner); Sioux Co., where it is a not rare summer resident (L. Bruner).

511. *Quiscalus quiscula æneus* (Ridgw.).—Bronzed Grackle. A very common breeder in middle and eastern Nebraska.

529. *Astragalinus tristis* (Linn.).—American Goldfinch. Over the entire state, not uncommon.

600. *Passer domesticus* (Linn.).—European House Sparrow; English Sparrow. Breeds in Nebraska.

538. *Calcarius ornatus* (Towns.).—Chestnut-collared Longspur. Holt county (Will Colt); breeds in the state (I. S. Trostler).

540. *Pooecetes gramineus* (Gmel.).—Vesper Sparrow; Grass Finch. Breeds throughout the state in fair numbers (numerous records).

540*a*. *Pooecetes gramineus confinis* Baird.—Western Vesper Sparrow. Cherry Co. (J. M. Bates).

542*a*. *Ammodramus sandwichensis savanna* (Wils.).—Savanna Sparrow. Breeds within the state (several records).

545. *Ammodramus bairdi* (Aud.).—Baird's Bunting. Sioux Co. (L. Bruner); a rare breeder (I. S. Trostler).

546. *Ammodramus savannarum passerinus* (Wils.).—Grasshopper Sparrow; Yellow-winged Sparrow. A common summer resident and breeder in the state, eastward.

546*a*. *Ammodramus savannarum perpallidus* (Ridgw.).—Western Grasshopper Sparrow. Cherry Co. (J. M. Bates); Broken Bow and Thedford (A. K. Fisher).

552. *Chondestes grammacus* (Say).—Lark Finch; Lark Bunting. A very common breeder in the Sand Hills and westward; rarer eastward.

560. *Spizella socialis* (Wils.).—Chipping Sparrow. A common breeder in the state according to the records at hand.

561. *Spizella pallida* (Swains.).—Clay-colored Sparrow. Cherry Co. (J. M. Bates).

562. *Spizella breweri* Cass.—Brewer's Sparrow. Cherry Co. (J. M. Bates).

563. *Spizella pusilla* (Wils.).—Field Sparrow. A very common breeder in eastern Nebraska.

563*a*. *Spizella pusilla arenacea* Chadb.—Western Field Sparrow. Broken Bow, July 8, 1893 (A. K. Fisher); Long Pine, July 11, 1900 (J. M. Bates).

581. *Melospiza melodia* (Wils.).—Song Sparrow. A not very common breeder over the state (several records).

584. *Melospiza georgiana* (Lath.).—Swamp Sparrow. Lincoln (J. S. Hunter); Neligh (Merritt Cary).

587. *Pipilo erythrophthalmus* (Linn.).—Chewink; Towhee. A common summer resident and breeder over eastern half of state.

588. *Pipilo maculatus arcticus* (Swains.). -Arctic Towhee. Dawes Co. (R. H. Wolcott, J. S. Hunter, L. Bruner); Cherry Co. (J. M. Bates).

593. *Cardinalis cardinalis* (Linn.).—Cardinal Grosbeak. Southeastern portions, fairly common.

595. *Zamelodia ludoviciana* (Linn.). -Rose-breasted Grosbeak. Quite common as a breeder and summer resident in eastern half of state.

596. *Zamelodia melanocephala* (Swains.).—Black-headed Grosbeak. Long Pine, June 14, 1899 (J. M. Bates).

597. *Guiraca cærulea* (Linn.).—Blue Grosbeak. Broken Bow, July 8, 1893; Red Cloud, July 2, 1893 (A. K. Fisher).

597*a*. *Guiraca cærulea lazula* (Lesson).—Western Blue Grosbeak. Cherry Co., June 7, 1893, July, 1899 (J. M. Bates).

598. *Cyanospiza cyanea* (Linn.).—Indigo Bunting. A rather common breeder in eastern third of state.

604. *Spiza americana* (Gmel.).—Dickcissel; Black-throated Bunting. An abundant breeder in Nebraska.

605. *Calamospiza melanocorys* Stejn.—Lark Bunting. A very common bird in summer where it breeds.

607. *Piranga ludoviciana* (Wils.).—Louisiana Tanager; Crimson-headed Tanager. Sioux Co. (L. Bruner); carrying nest material June 1, 1900 (Cary, Crawford).

608. *Piranga erythromelas* Vieill. Scarlet Tanager. Eastern part of the state as a summer resident and breeder.

611. *Progne subis* (Linn.).—Purple Martin; House Martin. Breeds quite commonly over the state where nesting places are available.

612. *Petrochelidon lunifrons* (Say). Cliff Swallow; Eaves Swallow; Mud Swallow. An abundant bird where suitable breeding places are to be found.

613. *Hirundo erythrogastra* Bodd.—Barn Swallow. All over the state in moderate numbers.

614. *Tachycineta bicolor* (Vieill).—White-bellied Swallow; Tree Swallow. Sioux Co. in holes in banks (L. Bruner); Omaha (L. Skow); in holes in stumps (I. S. Trostler).

615. *Tachycineta thalassina* (Swains.).—Violet-green Swallow. Sioux Co. (L. Bruner).

616. *Cliricola riparia* (Linn.). Bank Swallow. A common breeder in the state.

617. *Stelgidopteryx serripennis* (Aud.). Rough-winged Swallow. A not rare breeder in this state. Breeds in same places as does the preceding.

619. *Ampelis cedrorum* (Vieill.). Cedar Bird; Cedar Wax-wing; Cherry Bird. Omaha (L. Skow).

622*a*. *Lanius ludovicianus excubitoroides* (Swains.).—White-rumped Shrike. All of eastern half of the state but more especially southward.

624. *Vireo olivaceus* (Linn.).—Red-eyed Vireo. Quite common over eastern half of state, less so westward.

627. *Vireo gilvus* (Vieill.).—Warbling Vireo. Quite common as a summer resident and breeder in eastern Nebraska.

628. *Vireo flavifrons* Vieill.—Yellow-throated Vireo. Not rare as a breeder in the state southward and eastward.

629. *Vireo solitarius* (Wils.).—Blue-headed Vireo. West Point (L. Bruner); Omaha (I. S. Trostler), rare.

629*b*. *Vireo solitarius plumbeus* Coues.—Plumbeous Vireo. Sioux Co., May, 1899 (Bruner, Hunter, Wolcott).

631. *Vireo noveboracensis* (Gmel.).—White-eyed Vireo. Not rare as a summer resident and breeder in the state.

633. *Vireo bellii* Aud.—Bell's Vireo. This is our commonest vireo in Nebraska where it breeds in almost every plum thicket, as well as in other places.

636. *Mniotilta varia* (Linn.).—Black and White Creeping Warbler. Breeds over eastern half of state sparingly (several records).

637. *Protonotaria citrea* (Bodd.).—Prothonotary Warbler. Omaha (L. Skow, I. S. Trostler); Nebraska City (M. A. Carriker, Jr.).

641. *Helminthophila pinus* (Linn.).—Blue-winged Yellow Warbler. Found breeding near Omaha in 1900 (J. E. Wallace).

645. *Helminthophila ruficapilla* (Wils.).—Nashville Warbler. Nebraska City (M. A. Carriker, Jr.).

648. *Compsothlypis americana* (Linn.).—Parula Warbler. "Rearing their young in various parts of Nebraska" (Bull. No. 2, Div. Ornith.).

652. *Dendroica æstiva* (Gmel.).—Yellow Warbler; Summer Yellow Bird. Found breeding over the entire state, common.

656. *Dendroica auduboni* (Towns.).—Audubon's Warbler. Sioux Co., May 20, 1900 (Bruner, Cary, Crawford, Hunter).

658. *Dendroica rara* (Wils.).—Cerulean Warbler. Found breeding near Omaha, 1900 (Mullen, Wallace, Shoemaker, van Sant).

659. *Dendroica pennsylvanica* (Linn.).—Chestnut-sided Warbler. Omaha (L. Skow, I. S. Trostler).

674. *Seiurus aurocapillus* (Linn.).—Oven-bird; Golden-crowned Thrush. A common summer resident and breeder in the state.

675*a*. *Seiurus noveboracensis notabilis* (Ridgw.).—Grinell's Water Thrush. Sioux Co. (L. Bruner).

676. *Seiurus motacilla* (Vieill.).—Louisiana Water Thrush; Large-billed Water Thursh. Peru (G. A. Coleman); Omaha (I. S. Trostler); Omaha, not uncommon (Roy Mullen, F. H. Shoemaker).

677. *Geothlypis formosa* (Wils.).—Kentucky Warbler. Omaha (L. Skow); Peru (G. A. Coleman).

681. *Geothlypis trichas* (Linn.).—Maryland Yellow-throat. Common over the eastern portions of the state.

681*a*. *Geothlypis trichas occidentalis* Brewst.—Western Maryland Yellow-throat. Less common than the preceding, and more westerly.

683. *Icteria virens* (Linn.).—Yellow-breasted Chat. Quite common as a breeder in the state, especially in eastern portions.

683*a*. *Icteria virens longicauda* (Lawr.).—Long-tailed Chat. Sioux Co. (R. H. Wolcott).

687. *Setophaga ruticilla* (Linn.).—American Redstart. Found as a summer resident and nester over the greater part of state.

703. *Mimus polyglottos* (Linn.).—Mockingbird. Sidney, North Platte and Lincoln (L. Bruner). This bird is becoming more abundant than formerly in the state.

704. *Galeoscoptes carolinensis* (Linn.).—Catbird. A very common nester over the entire state in suitable places.

705. *Harporhynchus rufus* (Linn.).—Brown Thrasher. Nearly as common as the preceding throughout Nebraska.

715. *Salpinctes obsoletus* (Say).—Rock Wren. Sioux Co. (L. Bruner); Cherry Co. (J. M. Bates).

721. *Troglodytes ædon* Vieill.—House Wren. Eastern half of state, rarer westward.

721*b*. *Troglodytes ædon aztecus* (Baird).—Western House Wren. Perhaps the commoner form here in the state.

724. *Cistothorus stellaris* (Licht.).—Short-billed Marsh Wren. In suitable places west to middle of state.

725. *Cistothorus palustris* (Wils.).—Long-billed Marsh Wren. A fairly common breeder in the state, especially in the Sand-hill Region.

727. *Sitta carolinensis* Lath. White-bellied Nuthatch. Eastern Nebraska, where it is a common nester.

727*a*. *Sitta carolinensis aculeata* (Cass.).—Slender-billed Nuthatch. Quite common westward, less so in eastern part of state.

730. *Sitta pygmæa* Vig.—Pygmy Nuthatch. Omaha, "a rare resident, breeds" (I. S. Trostler).

735. *Parus atricapillus* Linn. Chickadee; Black-capped Titmouse. Quite common in eastern Nebraska.

735*a*. *Parus atricapillus septentrionalis* (Harris).—Long-tailed Chickadee. Found nesting over entire state, most abundant in western portions.

751. *Polioptila cærulea* (Linn.).—Blue-gray Gnatcatcher. Omaha and Bellevue (Mullen, Trostler and Wallace).

754. *Myadestes townsendii* (Aud.).—Townsend's Solitaire. Sioux Co., May 25, 1900, two nests (Cary, Crawford, J. S. Hunter).

755. *Hylocichla mustelinus* Gmel.—Wood Thrush. A not uncommon nester in Nebraska where it is quite generally distributed.

758*a*. *Hylocichla ustulatus swainsonii* (Caban.). Olive-backed Thrush. Long Pine (J. M. Bates); Sioux Co., in breeding season (L. Bruner).

759*b*. *Hylocichla aonalaschkæ pallasii* (Caban.).—Hermit Thrush. Alda (Bull. No. 2, U. S. Div. Ornith.).

761. *Merula migratoria* (Linn.).—American Robin. Entire state, common.

766. *Sialia sialis* (Linn.).—Bluebird. Over the entire state, but less common than formerly.

768. *Sialia arctica* Swains.—Rocky Mountain Bluebird. Sioux, Dawes and Scott's Bluff Cos. (L. Bruner).

II.—A LIST OF SUCH OTHERS OF OUR BIRDS AS UNDOUBTEDLY BREED HERE, BUT CONCERNING WHICH MORE DEFINITE DATA AS TO SUCH BREEDING IS DESIRED, TOGETHER WITH RECORDS WHICH ARE DEFINITE BUT NEED VERIFICATION

70. *Sterna hirundo* Linn.—Common Tern. Observed in Cherry Co., June, 1900 (J. S. Hunter); and in Holt Co., July (L. Bruner).

167. *Erismatura jamaicensis* (Gmel.).—Ruddy Duck. Several pairs seen on lakes in Cherry Co., June 7, 1900, where it probably breeds (J. S. Hunter).

203. *Nycticorax violaceus* (Linn.).—Yellow-crowned Night Heron. "Rare, breeding at McCook" (Ludwick).

212. *Rallus virginianus* Linn. Virginia Rail. Supposed to breed in vicinity of Omaha (I. S. Trostler).

225. *Recurvirostra americana* Gmelin.—American Avocet. A very probable breeder in central and western part of state about the alkali lakes where the birds have been seen during late spring and summer. It has been found breeding by J. M. Bates just across the line in South Dakota.

226. *Himantopus mexicanus* (Müll.).—Black-necked Stilt. A rare visitor eastward, but more frequent in western part of state. Said to nest in western Kansas.

230. *Gallinago delicata* (Ord). Wilson's Snipe. Breeding at North Platte (M. K. Barnum). Was also seen in Cherry Co., June 3 to 10, 1900, by J. S. Hunter, and late June (I. S. Trostler).

249. *Limosa fedoa* (Linn.).—Marbled Godwit. This bird has been observed a number of times during summer, but no nests have been taken to my knowledge.

309. *Centrocercus urophasianus* (Bonap.).—Sage Grouse; Sage Cock. A permanent resident in the Hat Creek Valley of Sioux Co., where it is reported to nest.

315. *Ectopistes migratorius* (Linn.).—Passenger Pigeon. Perhaps entirely extinct so far as its occurrence in Nebraska is concerned, formerly fairly abundant along the Missouri River.

337*b*. *Buteo borealis calurus* (Cass.).—Western Red-tailed Hawk. Jamaica, near Lincoln, May 12, 1891 (R. E. Preston).

347*a*. *Archibuteo lagopus sancti-johannis* (Gmel.). American Rough-legged Hawk. Among the buttes of northwestern part of state (L. Bruner.

355. *Falco mexicanus* Schleg.—Prairie Falcon. Sioux Co., May, 1900 (Bruner, Cary, Crawford and J. S. Hunter).

357. *Falco columbarius* Linn.—Pigeon Hawk. Breeds at McCook (Ludwick).

358. *Falco richardsonii* Ridgw.—Richardson's Merlin. According to A. K. Fisher this hawk breeds from western Kansas northward.

375*a*. *Bubo virginianus pallescens* Stone.—Western Horned Owl. Sioux Co. (L. Skow, W. D. Hunter).

432. *Selasphorus platycercus* (Swains.).—Broad-tailed Hummingbird. Not rare on Pine Ridge from Long Pine westward.

462. *Contopus richardsonii* (Swains.).—Western Wood Pewee. Omaha (L. Skow); Western Nebraska (Aughey).

491. *Nucifraga columbiana* (Wils.).—Clarke's Nutcracker. Sioux Co., rare (L. Bruner).

492. *Cyanocephalus cyanocephalus* (Wied).—Maximilian's Nutcracker; Pinon Jay. Sioux Co., entire year (L. Bruner).

501. *Sturnella magna* (Linn.).—Meadowlark. A number of records refer to the typical form as breeding within the state east of the 100th meridian. Is this a fact?

510. *Scolecophagus cyanocephalus* (Wagl.). Brewer's Blackbird. Indications tend to show that this bird breeds sparingly in western and northwestern Nebraska (L. Bruner).

539. *Rhynchophanes mccownii* (Laur.).—McCown's Longspur. Summer-resident, rare (Taylor); may breed in the state (Trostler).

542*b*. *Ammodramus sandwichensis alaudinus* (Bonap.). Western Savanna Sparrow. Omaha (L. Skow).

554*a*. *Zonotrichia leucophrys gambelii* (Nutt.).—Intermediate Sparrow. Lincoln (J. S. Hunter).

599. *Cyanospiza amœna* (Say).—Lazuli Bunting; Lazuli Finch. Sioux Co. (L. Bruner).

610. *Piranga rubra* (Linn.).—Summer Tanager. Lincoln (R. E. Preston); Omaha (L. Skow).

622. *Lanius ludovicianus* (Linn.).—Loggerhead Shrike; Butcher Bird. West Point (L. Bruner).

627*a*. *Vireo gilvus swainsoni* Baird.—Western Warbling Vireo. Sioux Co., May 23, 1900 (Cary, Crawford and J. S. Hunter).

655. *Dendroica coronata* (Linn.).—Yellow-rumped Wrbler; Myrtle Warbler. It is said by Ludwick to breed at McCook.

662. *Dendroica blackburniæ* (Gmel.).—Blackburnian Warbler. Breeds at McCook (Ludwick).

673. *Dendroica discolor* (Vieill.). Prairie Warbler. Eastern Nebraska (Aughey).

679. *Geothlypis philadelphia* (Wils.). Mourning Warbler. Eastern Nebraska (Oliver Davie).

702. *Oroscoptes montanus* (Towns.).—Sage Thrasher. Alliance, Nebraska, July 12, 1893 (A. K. Fisher).

718. *Thryothorus ludovicianus* (Lath.).—Carolina Wren. Said to be a rare breeder in the southeastern corner of state.

726. *Certhia familiaris americanus* (Bonap.).—Brown Creeper. Omaha (I. S. Trostler); found nest in knot hole near Dakota City (Aughey).

728. *Sitta canadensis* Linn.—Red-bellied Nuthatch. A rare bird over the entire state, seen by several observers as late as latter part of May, but no actual records of nesting at hand.

729. *Sitta pusilla* Lath. Brown-headed Nuthatch. Sioux Co., February 26, 1896, "a single specimen of a nuthatch with brown head seen but not taken" (L. Skow). This is included on the above record since the nuthatches are practically non-migratory.

731. *Parus bicolor* Linn. Tufted Titmouse. Said by I. S. Trostler to be a rare resident near Omaha.

Formerly several of the birds listed here were regularly at home within the state, but these have now almost or entirely disappeared at nesters at least. Some of these that might be mentioned are the Wild Turkey, Passenger Pigeon, Carolina Paroquet, and the Trumpeter and Whistling Swans.

III.—A LIST OF POSSIBLE BREEDERS IN NEBRASKA, BASED ON VARIOUS RECORDS WHICH MIGHT BE TAKEN AS FAIRLY RELIABLE CIRCUMSTANTIAL EVIDENCE TOWARDS ESTABLISHING THEIR RIGHT TO BE PLACED IN THIS LIST, BUT WHICH CANNOT BE GIVEN AT THIS TIME ON ACCOUNT OF LACK OF SPACE

59. Franklin's Gull.
120*a*. Florida Cormorant.
133. Dusky Duck.
139. Green-winged Teal.
141. Cinnamon Teal.
149. Lesser Scaup Duck.
186. Glossy Ibis.
187. White-faced Glossy Ibis.
196. Great White Egret.
204. Whooping Crane.
215. Little Yellow Rail.
216. Black Rail.
241. Baird's Sandpiper.
242. Least Sandpiper.
246. Semi-palmated Sandpiper.
248. Sanderling.
278. Snowy Plover.
281. Mountain Plover.
308*a*. Columbian Sharp-tailed Grouse.
329. Mississippi Kite.
337*d*. Harlan's Red-tailed Hawk.
356. Duck Hawk.
405. Pileated Woodpecker.
418*a*. Frosted Poor-will.
420*c*. Sennett's Nighthawk.
459. Olive-sided Flycatcher.
463. Yellow-bellied Flycatcher.
474. Horned Lark (typical).
484. Canada Jay (484*a*?).
486. American Raven.
487. White-necked Raven.
509. Rusty Blackbird.
521. American Crossbill.
533. Pine Siskin; Pine Finch.
547. Henslow's Sparrow.
547*a*. Western Henslow's Sparrow.
554. White-crowned Sparrow.
566. White-winged Junco.
567. Slate-colored Junco.
578. Cassin's Sparrow.
581*j*. Dakota Song Sparrow.
583. Lincoln's Song Sparrow.
626. Philadelphia Vireo.
630. Black-capped Vireo.
639. Worm-eating Warbler.
646. Orange-crowned Warbler.
647. Tennessee Warbler.
650. Cape May Warbler.
657. Magnolia Warbler.
661. Black-poll Warbler.
663*a*. Sycamore Warbler.
667. Black-throated Green Warbler.
680. Macgillivray's Warbler.
684. Hooded Warbler.
686. Canadian Warbler.
701. Water Ouzel.
719. Bewick's Wren.
749. Ruby-crowned Kinglet.
756. Wilson's Thrush.
756*a*. Willow Thrush.
761*a*. Western Robin.

A PECULIAR DISEASE OF BIRDS' FEET OBSERVED IN CENTRAL NEBRASKA

ERWIN H. BARBOUR, LINCOLN

As curator of the State Museum, objects of varied kinds come to the notice of the writer, and there may be found a possible justification for wandering from one's own field of investigation far enough to make mention of certain pathological specimens which may be of interest to the Nebraska Ornithologists' Union. In south central Nebraska there is a dermal affection prevalent among birds, and a presumably similar affliction among rabbits, of a nature so serious as to apparently merit exact and critical investigation by some student. The distressing nature of the malady may be judged of in part by a glance at the figure, while

that of the birds may be seen in Plate X, figures 1, 2, 3, 4, which show the scutella of the feet grown into curved, over-lapping, horny excrescences, so crowded together as to render the toes partially immovable, and preventing them from touching the ground in the customary way. This leads at once to an abnormal growth and consequent distortion of the claws. The feet thus altered and enlarged are impediments indeed, adding to the weight of the bird in flight, hindering freedom of movement when upon the ground in search of food, or when attempting to perch upon boughs, and obviously being greatly in the way upon the nest. It is to be doubted if incubation is possible in such cases. Judging from cases reported, Kearney and Buffalo Counties are about the center of the affected district. It seems more than a coincidence that this is also the region where the so-called "horned" rabbits are commonest. Hunters in these counties often report that in certain years four out of five rabbits must be thrown away because of the prevalence of "horns" generally growing about the mouth and nose, but occasionally upon the limbs. According to the hunters, the affliction is so common in certain years that it seems to be universal, and it is repeatedly stated that hundreds are shot to be rejected. They are almost invariably more or less emaciated and ill-conditioned creatures generally. The excrescences, which resemble veritable horns, are black in color, firm, though fibrous, in texture, and in shape exactly like a miniature horn a couple of inches long. The firmness of texture is such that the horns are capable of taking a polish like true horn. They are strictly dermal, and when the skin is fresh a small slightly irritated and inflamed patch may be seen encircling the base of each cornu. The cornua are often so crowded together around the nose and mouth that one fails to see how the unfortunate victim ever obtained the food necessary for bare subsistence. A number of such examples have been received by the State Museum during the past five or six years, some of them being mounted, while others are preserved in alcohol.

Head of "horned" rabbit.

Unfortunately there has been no opportunity for observing either the rabbits or the birds in the field, and since the specimens at hand have dried the writer fails to find the cause of the trouble, which, nevertheless, seems to be attributable to some species of mite, possibly a *Sarcoptes*. Among poultry the disease known as "rough leg" or "scaly leg" is caused by the mite *Sarcoptes mutans*, living parasitically under the scales of the forward part of the foot and metatarse known respectively as the acropodium and acrotarsium. The result is a roughening and distention of the parts affected, and finally weakened vitality, general debility, and even death of the fowl in extreme cases. In the case of the domestic fowl it is a disease readily curable, but not so in the case of the wild animals and birds, which possibly become instrumental in the transmission of the mite, for, so far as the writer can see, the diseases are identical. In anticipation of the evil resulting from the possible transmission of this disease from barnyard to barnyard by the blackbirds to which the disease seems to be confined, the writer ventures beyond his legitimate field of pursuit to urge upon some student the recognition of this as a matter worthy of special investigation.

INTERNAL PARASITES OF NEBRASKA BIRDS

HENRY B. WARD

Repeated inquiries regarding the prevalence of internal parasites in our birds and the significance of these forms for their hosts leads me to present here a brief statement of our present knowledge on this subject, together with short references to the work of past observers, in the hope that this may lead to the accumulation of sufficient data for a more complete handling of the topic at some future time. In the historical review which opens the paper reference is made only to the more recent writers and those in particular whose work bears on the ecological side of the question.

In that chapter of his work which is especially devoted to the Entozoa of game birds and those of the common fowl Cobbold (69) says that the epidemic of 1867 among grouse in Great Britain was not due, as believed by many, to the prevalence of cestoid Entozoa. He tabulates 21 species which have been found in pheasant, grouse, partridge, quail and barnyard fowl. Most of them are innocuous, a few harmful, and only one, the gapworm (*Syngamus trachealis* v. Sieb.), of serious import. He refers to our lack of knowledge of the adults, our absolute ignorance of their development, and concludes with the observation that in his experience the forms are regularly very numerous, but cannot be satisfactorily defined or identified. What he says is almost equally true at the present day and an unfortunate limitation on the study of this

subject. The indispensable Compendium of Helminthology, by von Linstow (78), and its appendix (89), lists the recorded parasites, including those of birds, up to the year 1889. Considering the magnitude of the task there are few omissions, and the references enable one to follow the literature of avian parasites; but the author does not attempt to deal critically with species, giving only the precise record of each author quoted. It is interesting to summarize the records given: nearly one thousand hosts are listed as sheltering about 2,700 kinds of parasites, many of which, however, are identical species. The numbers for the individual groups are given in the following table:

Names of Avian Groups Used	Compendium up to 1878		Appendix 1878 to 1889	
	No. of Hosts	No. of Parasites	No. of Hosts	No. of Parasites
1. Psittaci	30	45	4	5
2. Coccygomorphae	50	87	27	28
3. Pici	21	38	5	6
4. Macrochires	23	42	5	7
5. Passerinae	186	456	79	115
6. Raptores	94	360	43	77
7. Gyrantes	8	14	6	8
8. Rasores	40	112	25	44
9. Brevipennes	2	5	6	10
10. Grallae	66	280	35	67
11. Ciconiae	40	156	19	34
12. Lamellirostres	51	362	24	43
13. Steganopodes	12	30	7	14
14. Longipennes	30	131	18	27
15. Urinatores	16	103	8	12
Total	669	2221	311	497

In two papers, Lönnberg (89 and 90) records with great care the results of extended helminthological studies on the cestodes of Sweden and Norway. A considerable percentage of the hosts examined were birds. In addition to statistical information regarding the parasites morphological data of importance are also included. Reference should be made in this connection to the admirable manual of Railliet (93-5) which gives the most complete account available of all the parasites found in domesticated animals, including also many associated wild species. Many important references to avian parasites are made in this work.

Mühling (98) has subjected the birds of Eastern Prussia to careful examination and finds in 445 hosts belonging to eighty-one species about 51 per cent infected, a number coincident with that observed here in Nebraska among domestic fowls. The full tables of this author are valuable records of the distribution of the parasites among the hosts studied; unfortunately he gives no data regarding the frequence of infection nor, save in a very general way, of the abundance of the different species of parasites. Volz (99) investigated the prevalence of

PLATE VI

YOUNG ROSE-BREASTED GROSBEAKS
Female, July 10.

nematodes, or round worms, in birds from the vicinity of Freiburg i. Br., Germany. He found thirty species of parasites in thirty-two hosts. Two hosts each harbored five species of parasites, two four each, three three each, four two each, and the remainder only a single species of parasite. In general the crow, raptores and gallinaceous birds were worst infected with nematodes in respect to numbers both of species and of individuals present. Hausmann (99) found that of species infected 30 per cent of the individuals harbored trematodes, a figure which has only relative value, as in the same lot of birds enough uninfected species were contained to reduce the percentage to 20. The infection was in most cases light.

The results of the most extended study yet made by any investigator are given by Wolffhügel (00). The large majority of the birds he studied came from the vicinity of Freiburg in Baden, but a number of foreign birds which had been held in captivity were obtained from the Zoological Garden at Basle, Switzerland. Among the 630 birds investigated, 231 harbored cestodes, 124 trematodes, 252 nematodes, and 41 Echinorhynchi, while 180 were free from parasites. Percentages cannot be calculated from these figures without further consideration since, for instance, land birds are rarely infested by Echinorhynchi, but ducks commonly, so that the total depends evidently on the number of ducks examined.

Wolffhügel examined 73 species belonging to 62 genera of birds and found in them 19 species of trematodes, 35 of cestodes, 25 of nematodes, and 9 of Echinorhynchi. There are extensive tables showing full details of the extent and character of infection manifested by each bird examined, and a careful discussion of structural details in a number of new and poorly known species of cestodes.

The most extensive and important American contribution to the distribution of avian parasites is that by Stiles & Hassell (96). It deals primarily with tapeworms of poultry, but the species treated are also found in other birds. The discussion given by these authors affords the only accessible source of information regarding certain foreign publications of importance on some of the avian cestodes. Many figures from such inaccessible authorities have been reproduced so that the paper gives a complete presentation of the work done on the forms cited therein.

The check-lists given by Hassall (98, 98a, 98b) are invaluable to scientific workers for the full and exact treatment of the synonymy of the parasites. Though only domesticated birds are given here the same species of parasites are more or less frequently met with among wild fowl.

In a previous paper (Ward, 98) I have given a discussion of the parasites of domesticated birds based on observations made in Nebraska.

The effects of parasites, the degree of infection, and the general features of preventive treatment are discussed. To this are added data regarding the taxonomy of some of the more common forms, their life history and the diseases they produce. This article was followed by a second (Ward 98a) one section of which contains a synopsis of examinations made on domesticated birds at Lincoln and on some from a neighboring state from which the following percentages appear for the chick:

	Free	Cestodes alone	Nematodes alone	Both	Total No. examined
Nebraska	51	16	16	16	99
Iowa	23	23	14	40	100

It also was shown that the liability to cestode infection decreases rapidly with growth, but that the liability to nematode infection increases with age. Whether this holds true of other species or under other conditions than those of domestication remains to be investigated. The case demonstrates, however, that in all conclusions the factor of age must be considered.

It would be impossible to make mention here of all the morphological work which has been done recently even though it is of great value to the worker in helminthology. Numerous papers by Cohn, Fuhrmann, Hausmann, Lühe, Lönnberg, Kowalewski, Railliet, Volz, Wolffhügel, and others, have contributed to clear up the confusion existing in this group and make its complete revision possible.

Regarding the morphology of the avian parasites from this country, it may be said that a paper by Linton (92) constitutes almost the only record of any extent since the brief notes of Leidy published many years ago. Linton described the parasites of six species of birds from Yellowstone National Park examined in August, 1890, together with a few Entozoa collected at Guaymas, Mexico, in February, 1891. It is unfortunate that the accounts given are not sufficiently extended to permit of ready use by others.

From this laboratory Ransom (00) described a peculiar species of cestode known thus far only from the alimentary canal of the turkey.

"It is not easy for people unacquainted with the phenomena of parasitism and with the mode of distribution of the Entozoa," says Cobbold, "to shake off the very prevalent notion that tapeworms are generally only in diseased or unhealthy animals. This old and erroneous idea has been handed down from age to age, and it will probably prevail among us for many years to come" (69, p. 66). The frequence of parasitic infection in birds has been clearly shown by the preceding abstracts from various authors. It is now important to inquire concerning the bearings of this fact. In the first place it may be safely affirmed that none of these species are dangerous to man. Not only that the alimentary canal and its adnexa are universally removed be-

fore the birds are cooked, but also that the species of Entozoa which are at home in birds are not such as attack man; and should one come by chance into the human alimentary canal, it would not be able to maintain its position there. At least in all the recorded observations on human parasites, which have been more carefully studied than those of any other host, there is no mention of the occurrence of an avian form. On the other hand the influence of the parasite on the host is of importance. Birds are, comparatively speaking, badly infested with parasites, and in proportion to the volume of the host the parasites are proportionately large so that their effect must be all the more noticeable. The draft on the host for nourishment, the irritating effect of the parasite in the alimentary wall, and the tendency to occlude the canal are all factors which must be considered. But the most unfortunate fact in the presence of parasites is the possibility of an epidemic which is given thereby.

It is a characteristic feature of Entozoa that the reproductive power is greatly above that of free-living species in view of the conditions which ordinarily combine to destroy the larva before it can reach a new host. Under usual circumstances, then, only a small fraction of the embryos develop to mature individuals. There arise, however, from time to time such conditions as bring to maturity an unusual number of parasites. What such conditions are cannot be stated in general, for it depends upon the life history of each particular species. It may be that a wet year, the abundance of some other form of animal in which one stage of the life history is passed, a mild winter, or even more trivial factors bring about unexpectedly a radical increase in the numbers of a certain parasite, and there results in consequence a parasitic epidemic with serious results to birds of a given species and territory. Such epidemics, due to cestodes and to trematodes, are recorded in Europe among game birds and no doubt are more frequent than is evinced by the records.

In view of these facts it is important to secure more extended information regarding the degree of infection to which American birds are subject and the species of parasites by which they are infested. During the past eight years the Department of Zoology at the University of Nebraska has been collecting material and keeping very precise records of these facts for such Nebraska birds as could be examined. There are included in the hosts examined both native and migratory birds, and the records have been made by a considerable number of observers to all of whom I am much indebted for the assistance given thus.

Considering first the question of the species of parasites found, one may say that the statement of Cobbold (69) regarding the parasites of English birds is equally true of these from Nebraska birds; they cannot yet be satisfactorily defined or identified. It will be the work of some time to determine clearly how many are new and how many

agree with known, but poorly described, European forms. Thanks to the careful work of a number of investigators at Königsberg and at Basle, the latter are being steadily worked up and it is planned to effect the same result here. In view of the large number of forms yet unknown is seems wise at present, however, to withhold all names rather than to publish many blanks in the list. Of many forms more material is needed for the determination of that now in hand and any gifts will be gladly received. Specimens can be preserved with ease in formol (5 to 10 per cent), better if a few drops of acetic acid has been added, and sent in this fluid or in alcohol. The head of the parasite is of importance for the determination of the species as are also the ripe segments at the opposite end of the chain.

The appended table gives a list of the species of birds thus far examined, the number of individuals found infected and free, and the kinds of parasite represented. In arranging the list of hosts the numbers and names of the A. O. U. check list have been followed without exception:

	Name of Host	Locality	Number examined	Age	Number free	Number with Cestodes	Number with Nematodes	Number with Trematodes	Number with Echinorhynchi
6.	Podilymbus podiceps (Linn.).—Pied-billed Grebe	Creston, Ia.	1	ad.	..	....	....	1	....
57*a*.	Larus argentatus smithsonianus Coues.—Herring Gull	Lincoln, Nebr.	1	juv.	1	....	....	....	....
58.	Larus atricilla Linn.—Laughing Gull (?)	Lincoln, Nebr.	2	juv.	..	2	....	....	....
131.	Lophodytes cucullatus (Linn.)—Hooded Merganser	Creston, Ia.	1	ad.	..	1	....	....	....
		Lincoln, Nebr.	1	....	..	1	....	....	....
140.	Querquedula discors (Linn.).—Blue-winged Teal	Lincoln, Nebr.	2	....	2	....	....	....	....
142.	Spatula clypeata (Linn.).—Spoonbill	Lincoln, Nebr.	1	....	1	....	....	....	....
		Lincoln, Nebr.	1	ad.	..	1	....	....	1
144.	Aix sponsa (Linn.).—Wood Duck	Lenox, Ia.	1	ad.	..	1	....	....	....
		Lincoln, Nebr.	6	ad.	6	....	....	....	....
146.	Aythya americana (Eyt.).—Redhead	Lincoln, Nebr.	3	....	1	2	....	....	....
201.	Ardea virescens Linn.—Green Heron	Lenox, Ia.	2	ad.	1	....	1	....	....
		Creston, Ia.	1	ad.	..	1	....	....	....
		Lincoln, Nebr.	1	juv.	..	1	....	....	....
		Lincoln, Nebr.	1	ad.	..	1	....	....	....
221.	Fulica americana Gmelin.—Coot	Lincoln, Nebr.	7	....	5	....	....	....	2
230.	Gallinago delicata (Ord).—Wilson's Snipe	Creston, Ia.	2	ad.	..	....	....	2	....
239.	Tringa maculata Vieill.—Pectoral Sandpiper	Lincoln, Nebr.	1	ad.	..	1	....	1	....
		Creston, Ia.	1	ad.	..	1	....	....	....
241.	Tringa bairdii (Coues).—Baird's Sandpiper*	Lincoln, Nebr.	16	ad.	5	11	....	....	....
		Lincoln, Nebr.	2	juv.	..	2	....	....	....
243*a*.	Tringa alpina pacifica (Coues).—Red-backed Sandpiper	Lincoln, Nebr.	1	ad.	1	....	....	....	....
	Snipe—sp. indet.	Lenox, Ia.	1	ad.	..	1	....	....	....
		Lincoln, Nebr.	2	....	2	....	....	....	....
255.	Totanus flavipes (Gmel.).—Yellow-legs	Creston, Ia.	1	....	1	....	....	....	....
261.	Bartramia longicauda (Bechst.).—Bartramian Sandpiper	Creston, Ia.	1	juv.	..	1	....	....	....
273.	Ægialitis vocifera (Linn.).—Killdeer	Lincoln, Nebr.	2	ad.	2	....	....	....	....
289.	Colinus virginianus (Linn.).—Bob-white	Lincoln, Nebr.	1	ad.	1	....	....	....	....
316.	Zenaidura macroura (Linn.).—Dove	Polen, Ia.	1	ad.	1	....	....	....	....

*May have included other species, though most of them undoubtedly this.

	Name of Host	Locality	Number examined	Age	Number free	Number with Cestodes	Number with Nematodes	Number with Trematodes	Number with Echinorhynchi
331.	Circus hudsonius (Linn.). Marsh Hawk	Lincoln, Nebr.	1	ad.	1	....	....	....	....
360.	Falco sparverius Linn.—Sparrow Hawk	Seymour, Ia.	1	ad.	1	....	....	....	....
		Pine Ridge,Nb.	1	ad.	..	....	1	....	....
366.	Asio wilsonianus (Less.).—Long-eared Owl	Lincoln, Nebr.	1	....	1	....	....	....	....
390.	Ceryle alcyon (Linn.).—Kingfisher	Lincoln, Nebr.	2	ad.	1	....	1	....	....
406.	Melanerpes erythrocephalus (Linn.).—Red-headed Woodpecker	Polen, Ia.	2	ad.	..	2	....	....	....
408.	Melanerpes torquatus (Wils.).—Lewis's Woodpecker	Pine Ridge,Nb.	1	ad.	..	1	....	....	....
412*a*.	Colaptes auratus luteus Bangs.—Northern Flicker	Creston, Ia.	3	ad.	1	2	....	....	....
		Creston, Ia.	2	juv.	1	1	....	....	....
		Lincoln, Nebr.	3	ad.	1	1	....	....	1
425	Aeronautes melanoleucus (Baird).—White-throated Rock Swift	Pine Ridge,Nb.	1	ad.	..	1	1	....	....
444.	Tyrannus tyrannus (Linn.).—Kingbird	Polen, Ia.	1	ad.	..	1	....	....	....
		Polen, Ia.	1	juv.	1	....	....	....	....
		Creston, Ia.	2	....	2	....	....	....	....
462.	Contopus richardsonii (Swains.).—Western Wood Pewee	Pine Ridge,Nb.	1	....	1	....	....	....	....
474*a*.	Otocoris alpestris arenicola Hensh.—Desert Horned Lark	Pine Ridge,Nb.	1	ad.	..	1	1	....	....
477.	Cyanocitta cristata (Linn.).—Blue Jay	Polen, Ia.	1	juv.	1	....	....	....	....
488.	Corvus americanus Aud.—Crow	Lenox, Ia.	2	ad.	2	....	....	....	....
		Lincoln, Nebr.	1	ad.	..	1	....	....	....
498.	Agelaius phœniceus (Linn.).—Red-winged Blackbird	Lincoln, Nebr.	1	ad.	1	....	....	....	....
		Polen, Ia.	2	ad.	1	1	....	....	....
501.	Sturnella magna (Linn.).—Meadowlark	Creston, Ia.	3	juv.	2	....	....	....	1
501*b*.	Sturnella magna neglecta (Aud.).—Western Meadowlark	Lincoln, Nebr.	2	ad.	..	2	....	....	....
511*b*.	Quiscalus quiscula æneus (Ridgw.).—Bronzed Grackle	Creston, Ia.	2	....	1	....	....	1	....
		Lincoln, Nebr.	1	ad.	1	....	....	....	....
	Passer domesticus (Linn.).—English Sparrow	Polen, Ia.	1	ad.	1	....	....	....	....
		Lincoln, Nebr.	6	ad.	6	....	....	....	....
521.	Loxia curvirostra minor (Brehm).—American Crossbill	Pine Ridge,Nb.	3	....	3	....	....	....	....
540*a*.	Pooecetes gramineus confinis Baird.—Western Vesper Sparrow	Pine Ridge,Nb.	2	ad.	1	....	1	....	....
595.	Zamelodia ludoviciana (Linn.).—Rose-breasted Grosbeak	Lincoln, Nebr.	1	....	..	....	1	....	....
596.	Zamelodia melanocephala (Swains.).-Black-headed Grosbeak	Pine Ridge,Nb.	1	....	1	....	....	....	....
607.	Piranga ludoviciana (Wils.).—Louisiana Tanager	Pine Ridge,Nb.	2	....	2	....	....	....	....
611.	Progne subis (Linn.).—Purple Martin	Creston, Ia.	2	ad.	1	1	....	....	....
622*a*.	Lanius ludovicianus excubitorides (Swains.)—White-rumped Shrike	Creston, Ia.	1	ad.	1	....	....	....	....
		Seymour, Ia.	1	ad.	1	....	....	....	....
704.	Galeoscoptes carolinensis (Linn.).—Catbird	Polen, Ia.	1	ad.	1	....	....	....	....
705.	Harporhynchus rufus (Linn.).—Brown Thrasher	Polen, Ia.	2	ad.	1	1	....	....	....
726.	Certhia familiaris americanus (Bonap).—Brown Creeper	Polen, Ia.	1	ad.	1	....	....	....	....
761.	Merula migratoria (Linn.).—Robin	Polen, Ia.	5	ad.	2	3	1	....	....
		Creston, Ia.	4	....	2	2	....	....	....
		Lincoln, Nebr.	1	ad.	..	1	....	....	....
766.	Sialia sialis (Linn.).—Bluebird	Creston, Ia.	1	....	..	1	....	....	....
768.	Sialia arctica Swains.—Mountain Bluebird	Pine Ridge,Nb.	1	....	1	....	....	....	....

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CHANGES IN THE BIRD FAUNA OF THE PRAIRIES IN THE PAST THIRTY YEARS

L. SESSIONS, NORFOLK

No one who has lived long in Nebraska can fail to note the changed appearance of our state since the first settlers attempted home-making on open prairie land without the companionship of trees to shelter them from sun and storm, and immediate care they gave to planting a little grove of some rapid growing variety of trees which were to meet this want. And while waiting, memory seemed ever taunting them with thoughts of the old home with its trees and birds. But the birds in their journeyings northward stopped to inspect the little grove and soon a partnership was formed with the homesteader, and family after family came to cheer him with their songs, and to aid in successfully combating the hordes of hungry insect pests which came swarming in from all sides.

In the spring of 1871 it was the writer's good fortune to see the prairies of northeast Nebraska in their native beauty. No overstocked pasture lands giving an impression of barrenness, but a rich growth of new grass covered, both upland and valley, with many tints of green.

The larger water courses were marked by a narrow belt of cottonwoods, but beyond this the country was almost destitute of tree or shrub. The supply of water in the uplands was very limited, especially so in the clay lands, and Chestnut-collared Longspurs and a few Lark Buntings were about the only evidences of bird life to be seen.

Along the valleys favorable conditions of food and shelter attracted birds in great numbers and species; their tameness being in marked contrast to the habits of their relatives in older states, and afforded the lover of birds many rare opportunities of noting their ways. I wish I could picture with my pen the wonderful abundance of certain families of birds at that time and so clearly draw the lines that by contrast with the present we might realize our loss.

Perhaps the most interesting scenes in bird life were to be found around prairie sloughs and small ponds in the Sand Hills. I have now in mind one of these ponds, located but a short distance from my home and which covered only about one acre in surface, where in the spring of 1876 I found Blue-winged Teal, Mud Hens, Eared and Pied-billed Grebes, Godwits, Long-billed Curlews, Wilson's Phalaropes, and a long list of sandpipers busily occupied with their homemaking. But herds of cattle have long since destroyed these favorite nesting places. The same is true of many of our creek valleys where sheltering thickets of wild plum, willow and other shrubs formerly afforded attractive homes for tree birds. But now well trodden muddy banks, close-cropped herbage and broken thickets afford but little attraction for our songsters.

To meet some of these losses we find that the groves planted on nearly every section, often every quarter section, with thickets of giant weeds growing in the fence corners, and watering troughs in every pasture and farmyard were quickly noted by the birds, and no time was lost in occupying the new fields. Now we find the familiar forms of our tree birds, such as thrushes, the Robin, the Catbird, orioles, jays and woodpeckers in great abundance. As proof of this a farmer friend told me he had just killed fifty thrushes to save eight or ten quarts of raspberries.

The Meadowlark, my especial favorite, remaining with us nearly the entire year, cheerful in song, a model of industry and without a single evil habit, has prospered and is found in goodly numbers everywhere. Formerly the Robin was to be seen in small flocks during spring and fall keeping close to the shelter of trees along the valleys. And not till 1885 was I able to find a pair nesting, but since then they have increased rapidly. I have seen flocks of them about my home in mild weather during every month of the past winter. We have noted with pleasure the added numbers each year of the joyous little songster, the Lark Bunting (*C. melanocorys*). The Eskimo Curlew was at one time very abundant and during the spring time moved northward in great numbers, reminding the homesteader of flights of passenger pigeons, and were given the name of "Prairie Pigeon." The large flocks and singular tameness proved a tempting mark for murderous guns. The Eskimo Curlew has long since ceased to be a feature of prairie life.

The Field Plover, comrade of the Meadowlark, and one of the few sweet songsters of open land whose every move is grace itself, was formerly abundant, but lawless shooting has greatly reduced their numbers.

Botaurus lentiginosus, whose love call boomed forth from every prairie slough, has become quite rare. While the Long-billed Curlew and Magpie, formerly common birds, have entirely disappeared from our list.

The Wild Turkey, noblest of our game birds, and at one time abundant wherever timber afforded them a home, is exterminated. The Sharp-tailed Grouse also has disappeared, but our little friends, the "Bob-whites," have prospered and are now very abundant.

The Crow has always been a somewhat rare bird with us. A few pairs nest here each year but surroundings do not seem to be just to their taste.

Of Raptores many species were well represented on our prairies, where gophers, squirrels, mice and insects furnished them an abundant supply of food. The rapid decrease in numbers of our birds of prey has been very marked. The man with a gun seems to have inherited as strong a prejudice against hawks and owls as the ordinary mortal has for snakes.

Mourning Doves now make their home in every farm grove, and I regret to note the growing desire to class them as game birds. The little scavengers are very useful to the farmer in destroying a vast amount

YOUNG ROSE-BREASTED GROSBEAKS
Male, first moult. August 26.

of weed seed to say nothing of their social disposition and harmless ways.

[At this point the author was interrupted by a sickness which prevented further work on the paper. It is to be hoped that at some future date he may resume his writing on this interesting subject.—EDITOR.]

ADDITIONAL OBSERVATIONS ON THE BIRDS OF NORTHWESTERN NEBRASKA

J. M. BATES, LONG PINE

It falls to the lot of some, through lack of time or ability, to confine themselves to the elementary work, in natural science, of observing and reporting. I am unfortunately one of those who are thus limited, and I can offer, after eleven years of interest in the birds of Nebraska, nothing that indicates intense study. I am, I regret to say, unable to make the subject anything more than an incident in my life and a side issue of the nature study I love so well. I take thought that others may be able to do better work for the little side-light that I may throw upon the work. The birds that are new to me keep coming, and the year 1900 has been very interesting, according to the time I have devoted to the subject.

As my chronological notes have been sent to Washington, I will take the birds in the order observed in our Nebraska list.

150. *Aythya collaris* (Donov.).—Ring-necked Duck. October 8, in looking over two hundred ducks killed for market at Cody, I found one that was new to me and took notes. It is noteworthy that Apgar in his supposedly popular work on the Birds of the United States, should not mention the most conspicuous mark on the duck, the broad white band one-third from tip of bill. November 8, I and a friend shot two out of a flock of twenty, at Merriman. Those sportsmen to whom I have mentioned it say they have not seen it.

190. *Botaurus lentiginosus* (Montag.).—American Bittern. Was seen November 10 near Long Pine and probably later. I have seen it a little later some years. No doubt it tarries as long as snakes and frogs are at large.

191. *Ardetta exilis* (Gmelin).—Least Bittern. I saw one Least Bittern while trouting on the Boardman Creek in Cherry County, July 7—apparently a very rare bird up our way.

194. *Ardea herodias* (Linn.).—Great Blue Heron. On June 26, while trouting on the Fairfield Creek in northwestern Brown County I found the tracks of the Great Blue Heron in the mud, too long for any other bird, I am sure. This indicates a new breeding locality.

201. *Ardea virescens* (Linn.).—Green Heron. July 17, I had the pleasure

of a good view of the Green Heron at Neligh, where it breeds. I am sure it does not come as far west as Brown County.

246. *Ereunetes pusillus* (Linn.).—Semipalmated Sandpiper. This bird was seen, I feel sure, on lake shores near Merriman, Cherry County, June 6. It is reported to me as summering there. The habits of this bird will bear more investigation, and I hope to throw more light upon them later on. I bespeak the co-operation of all who hear or read this paper. I see that one Nebraska note reads "Peru, rare—breeds (G. A. Coleman)." The question is whether anyone *knows* it to breed in Nebraska, or whether this is simply a natural inference drawn from its lingering presence in June and July.

264. *Numenius longirostris* (Wils.).—Long-billed Curlew. September 6, I shot, at Kennedy, Cherry County, a young Long-billed Curlew, in fine condition. I have never seen them after August heretofore.

281. *Ægialitis montana* (Towns.).—Mountain Plover. June 6, I saw four plover at Merriman whose markings and fearlessness indicated Mountain Plover. Unfortunately I had no gun with me. I shall go armed next time. They were new to me.

289. *Colinus virginianus* (Linn.).—Bob-white. June 26, the Quail were flying in large broods as well as the old birds, on Fairfield Creek, Brown County, in response to the remarkably mild and early season. It was not uncommon to mow out the quails' nests in Connecticut the first of July, and they were not the "second crop."

372. *Nyctala acadica* (Gmel.).—Acadian Owl. November 30, Will Smith, one of our members, found a Saw-whet Owl dead in Long Pine Canyon. As the bird has been saved, it is a welcome addition to our too few notes on this species.

461. *Contopus virens* (Linn.).—Wood Pewee. May 21, the Wood Pewee was taken in Long Pine Canyon. I recall hearing the same notes there, four or five years ago. July 25, I saw several, young and old apparently, on Snake Creek, Cherry County, while out with Prof. Barbour.

475. *Pica pica hudsonica* (Sab.).—American Magpie. Breeds at Chadron. I shot a fine specimen there in October. The note in our book stating on my authority that it breeds in Cherry County is a mistake, I think. On November 20 it was reported as wintering on the Niobrara north of Long Pine. Whether this migration is due to a premonition of a hard winter, or to the scarcity of food owing to the excessive drouth that prevailed this year west of Cherry County, becomes an interesting question.

492. *Cyanocephalus cyanocephalus* (Wied).—Pinon Jay. Appeared in Long Pine to the number of fifty to a hundred, about September 15, and at Kennedy, Cherry County, five or six about the same date. I saw them October 18, and above November 1. Since then have had no opportunity to observe. They bring up the same question as the Magpie. We are perfectly willing they should return to their native wilds, to kill the wild birds rather than loot our chicken yards.

514. *Coccothraustes vespertinus* (Cooper).—Evening Grosbeak. October 27, I was fortunate in securing a male and two females of the Evening Grosbeak. I saw about twenty. I am sure they are rare with us, though I am so little in the canyon at that season that I ought not to speak confidently.

559*a*. *Spizella monticola ochracea* (Brewst.).—Western Tree Sparrow. October 15, I shot the Western Tree Sparrow at Kennedy and had it identified at Washington.

561. *Spizella pallida* (Swains.).—Clay-colored Sparrow. Is mentioned by two reporters in our list as arriving in May and October. It was the most common bird in the brush at Long Pine, August 25, this year.

563*a*. *Spizella pusilla arenacea* (Chadb.).—Western Field Sparrow. We were fortunate enough to find a belated nest of the Western Field Sparrow in Long Pine Canyon, where it was reported last year, July 11. The nest contained three eggs, and was in a young oak, about eight feet from the ground; the markings as described for the species. We took several birds at the same time.

567*a*. *Junco hyemalis oregonus* (Towns.).—Oregon Junco. I said last year in my notes regarding the Oregon Junco that it was doubtful whether our Long Pine birds were not chiefly to be referred to the variety. I find this October that they are about as abundant with us as the common Junco.

597*a*. *Guiraca cærulea lazula* (Lesson).—Western Blue Grosbeak. September 8, I took a female Western Blue Grosbeak at Kennedy. I must confess that the species and variety seem to me a little mixed. Mine is all right as to size but the wing bands agree better with the description of the species; while one in the possession of Will Smith at Long Pine, taken in breeding season has the size of the species and the wing markings of the variety. We run up against a large subject that is not yet settled in Botany nor in Ornithology.

633. *Vireo bellii* (Aud.).—Bell's Vireo. Was identified by Mr. Merritt Cary, in Long Pine Canyon, August 25, but was too smart for us, and we failed to prove the contention.

681*a*. *Geothlypis trichas occidentalis* (Brewst.).—Western Yellow-throat. September 10, I shot the Western Maryland Yellow-throat at Kennedy —a bird new to me.

These few notes indicate what might be done in our field by a person better trained to the work, with younger eyes, and mind not wholly taken up with field botany, as mine is in my spare moments. The notes are worthy of preservation, no doubt, but I question whether they ought to take the valuable time of this assembly.

RESULTS OF A COLLECTING TRIP TO SIOUX COUNTY

J. C. CRAWFORD, JR., WEST POINT

The party consisted of Professor Bruner, Messrs. J. S. Hunter, Merritt Cary, and myself, and arrived at Harrison on May 18, 1900. Professor Bruner had to return to Lincoln May 22, while the rest stayed until June 1. On the afternoon of our arrival, we drove out to Monroe Canyon, where we camped.

The country is an excellent one for collecting. The canyons extend across the country in a line from northeast to southwest with the table lands to the southeast and the Hat Creek valley with the Bad Lands to the northwest.

The trees in the canyons are mainly pines on the sides, and at the bottoms elm, maple, birch, cottonwood, ash and willow are mingled with the pines. The canyons are well watered, nearly every one having a creek, with branches running from the many side canyons.

Here our collecting was done; the only variation being a trip to the Bad Lands on May 20, and the observations made on the table lands on the way out and on the return.

140. *Querquedula discors* (Linn.).—Blue-winged Teal. A few seen May 19, at Andrews.

261. *Bartramia longicauda* (Bechst.).—Bartramian Sandpiper. Seen May 18, near Crawford; also June 1, on table lands near Harrison. Common.

273. *Ægialitis vocifera* (Linn.).—Killdeer. May 18; also seen in the Bad Lands, May 20.

289. *Colinus virginianus* (Linn.)—Quail. May 18, near Andrews.

308. *Pediocetes* sp.—Sharp-tailed Grouse. One May 20, on the edge of Bad Lands, but not secured.

316. *Zenaidura macroura* (Linn.).—Mourning Dove. Very common.

325. *Cathartes aura* (Linn.).—Turkey Vulture. Common.

332. *Accipiter velox* (Wils.).—Sharp-shinned Hawk. Breeding. A nest found May 23, and the set of five eggs secured yater.

333. *Accipiter cooperii* (Bonap.).—Cooper's Hawk. One seen May 19.

337*a*. *Buteo borealis kriderii* Hoopes.—Krider's Red-tail. Found breeding on a high cliff about eighty feet from the base. From a tree near by we were able to see that the nest contained two eggs, but we could not get at them.

342. *Buteo swainsoni* Bonap.—Swainson's Hawk. Seen May 19.

347*a*. *Archibuteo lagopus sancti-johannis* (Gmel.).—American Rough-legged Hawk. May 18, a hawk was seen which was supposed to be a Rough-leg, and was so dark that it seemed this species, but we were not close enough to be positive.

349. *Aquila chrysaetos* (Linn.).—Golden Eagle. One seen May 23.

355. *Falco mexicanus* Schleg.—Prairie Falcon. One was seen May 18.

360. *Falco sparverius* Linn.—Sparrow Hawk. A very common hawk. Found breeding and eggs secured.

368. *Syrnium nebulosum* (Forst.).—Barred Owl. Heard every night.

378. *Spcotyto cunicularia hypogaea* (Bonap.).—Burrowing Owl. Seen May 19.

387. *Coccyzus americanus* (Linn.).—Yellow-billed Cuckoo. A few seen.

393*c*. *Dryobates villosus hyloscopus* (Cab.).—Cabanis's Woodpecker. Breeding. Two sets, one of four and the other of three, found May 28 and 29, respectively.

406. *Melanerpes erythrocephalus* (Linn.).—Red-headed Woodpecker. Seen at various times in the canyons.

408. *Melanerpes torquatus* (Wils.).—Lewis's Woodpecker. Found in the canyons wherever dead trees predominated. One nest was found about sixty feet from the ground in a dead tree, but contained no eggs. This same tree yielded a set of five Sparrow Hawk's eggs.

412*a*. *Colaptes auratus luteus* Bangs.—Northern Flicker.

413. *Colaptes cafer collaris* (Vigòrs).—Red-shafted Flicker. Both were seen in the canyons in about equal numbers.

418. *Phalænoptilus nuttallii* (Aud.).—Poorwill. Heard very commonly every night and one secured.

420. *Chordeiles* sp.—Nighthawk. Seen June 1.

425. *Aeronautes melanoleucus* (Baird).—White-throated Swift. Many were seen and were breeding in a large cliff, but we could not get at them.

444. *Tyrannus tyrannus* (Linn.).—Kingbird. Seen May 18, and also in the canyons.

447. *Tyrannus verticalis* Say.—Arkansas Kingbird. May 18, and also in the canyons. Common.

457. *Sayornis saya* (Bonap.). –Say's Phœbe. One was found building a nest in the canyons May 31, and one shot in the Bad Lands; also on buttes on table lands.

462. *Contopus richardsonii* (Swains.).—Western Wood Pewee. A single specimen secured May 24.

465. *Empidonax virescens* (Vieill.).—Acadian Flycatcher. One shot May 26.

466. *Empidonax traillii* (Aud.).—Traill's Flycatcher. Seen several times.

474*c*. *Otocoris alpestris arcnicola* Hensh. –Desert Horned Lark. Seen on the table lands above canyons.

475. *Pica pica hudsonica* (Sab.).—American Magpie. A good many seen, and one found with young May 23.

477. *Cyanocitta cristata* (Linn.).—Blue Jay. Seen May 18.

491. *Nucifraga columbiana* (Wils.).—Clarke's Nutcracker. One bird seen which is doubtfully referred here.

492. *Cyanocephalus cyanocephalus* (Wied).—Pinon Jay. Very common.

495. *Molothrus ater* (Bodd.).—Cowbird. Seen May 18.

498. *Agelaius phœniceus* (Linn.).—Red-winged Blackbird. Seen May 18, and several in the Bad Lands May 20.

501*b*. *Sturnella magna neglecta* (Aud.).—Western Meadowlark. Seen on the table lands and in the Bad Lands. Common.

508. *Icterus bullocki* (Swains.).—Bullock's Oriole. One secured May 24.

511*b*. *Quiscalus quiscula æneus* (Ridgw.).—Bronzed Grackle. Seen near Crawford.

529. *Astragalinus tristis* (Linn.).—American Goldfinch. Several seen.

540. *Pooecetes* sp.—Vesper Sparrow. A few seen.

545. *Ammodramus bairdii* (Aud.). Baird's Sparrow. Seen, May 18, on table lands.

552. *Chondestes grammacus* (Say).—Lark Sparrow. Common on table lands and in Bad Lands.

560. *Spizella socialis* (Wils.).—Chipping Sparrow. Breeding. A set of three eggs collected June 1.

561. *Spizella pallida* (Swains.). -Clay-colored Sparrow. Several seen in Bad Lands.

583. *Melospiza lincolnii* (Aud.).—Lincoln's Sparrow. Seen May 24.

588. *Pipilo maculatus arcticus* (Swains.).—Arctic Towhee. Common.

596. *Zamelodia melanocephala* (Swains.).—Black-headed Grosbeak. Several specimens shot.

599. *Cyanospiza amœna* (Say).—Lazuli Bunting. One seen May 18.

604. *Spiza americana* (Gmel.).—Dickcissel. May 19, near Harrison.

605. *Calamospiza melanocorys* Stejn.—Lark Bunting. Seen in Bad Lands May 20; common.

607. *Piranga ludoviciana* (Wils.).—Louisiana Tanager. Common. On June 1 a female was seen carrying material to build a nest.

614. *Tachycineta bicolor* (Vieill.).—Tree Swallow. Five or six seen, May 28.

622*a*. *Lanius ludovicianus excubitorides* (Swains.). White-rumped Shrike. A pair seen May 20, on the edge of Bad Lands, and one secured.

624. *Vireo olivaceus* (Linn.).—Red-eyed Vireo. Three shot and others heard.

627*a*. *Vireo gilvus swainsoni* Baird.—Western Warbling Vireo. One shot May 22.

629*b*. *Vireo solitarius plumbeus* (Coues).—Plumbeous Vireo. The most common vireo there; several shot.

647. *Helminthophila peregrina* (Wils.).—Tennessee Warbler. One was seen May 19.

652. *Dendroica æstiva* (Gmel.).—Yellow Warbler. A few seen near Crawford.

655. *Dendroica coronata* (Linn.).—Myrtle Warbler. One bird seen May 20, which is doubtfully referred here.

656. *Dendroica auduboni* (Towns.).—Audubon's Warbler. Very common. A nest found May 20, but contained no eggs, and unfortunately the female was shot for identification.

674. *Sciurus aurocapillus* (Linn.).—Oven-bird. Heard along nearly every creek in the canyons.

680. *Geothlypis tolmiei* (Towns.).—Macgillivray's Warbler. On May 22, Mr. Cary and myself saw a bird which was doubtfully referred here. Mr. Cary informs me that later acquaintance with the bird at Newcastle, Wyoming, makes his positive that it was this species which we saw.

681. *Geothlypis trichas* (Linn.). Maryland Yellow-throat. One specimen secured May 21.

683*a*. *Icteria virens longicauda* (Lawr.).—Long-tailed Chat. Each thicket of underbrush seemed to have one, but although several were shot at none were secured.

704. *Galeoscoptes carolinensis* (Linn.).—Catbird. Seen but once.

705. *Harporhynchus rufus* (Linn.).—Brown Thrush. A few seen.

715. *Salpinctes obsoletus* (Say).—Rock Wren. Heard at the rims of the canyons all around and one shot.

721. *Troglodytes aedon aztecus* (Baird).—Western House Wren. Common, and one shot.

727*a*. *Sitta carolinensis aculeata* (Cass.).—Slender-billed Nuthatch. One shot May 21.

728. *Sitta canadensis* Linn.—Red-bellied Nuthatch. One seen May 28.

735*a*. *Parus atricapillus septentrionalis* (Harris).—Long-tailed Chickadee. A nest found May 30 which had one young bird and one egg.

754. *Myadestes townsendii* (Aud.).—Townsend's Solitaire. Two nests were found. The first on May 25, was found near the bottom of a dry canyon, placed on the ground inside of an old burned tree, and contained four partly incubated eggs. The second, May 27, was also found in a dry canyon, but this time in a pocket in the side of a dry creek bed about four feet from the bottom. This contained no eggs, the set having been collected by a bullsnake which was killed near there. Examination of the stomach showed four badly incubated and broken eggs.

758*a*. *Hylocichla ustulata swainsoni* (Caban.). –Olive-backed Thrush. Quite common and several shot.

761. *Merula migratoria* (Linn.).—Robin. Nesting and a set of eggs secured.

766. *Sialia sialis* (Linn.).—Bluebird. A pair shot May 25.

768. *Sialia arctica* Swains.—Mountain Bluebird. Seen nearly every day on the sides of canyons near the top.

In addition a sandpiper and a thrush were seen which were not specifically identified.

The nesting of some of the birds seems to be especially interesting. The Krider's Hawk nested on a cliff; the Harris's Woodpecker laid only four and three eggs, while five is, I believe, regarded as a set. The Chickadee had but one egg and one young, and in addition was in a tree with a Sparrow Hawk. The Lewis's Woodpecker and a Sparrow Hawk had nests in one tree, and a Flicker was even flushed from a hole in the same tree, where it probably intended nesting. The Chipping Sparrow had only three eggs. The Robin and the Hawks seemed to be the only ones that had full sets, with the exception of the Solitaire noted above.

A COLLECTING TRIP IN CHERRY COUNTY

J. S. HUNTER, LINCOLN

A party consisting of Professor Bruner, J. C. Crawford, Jr., Merritt Cary and myself spent the latter part of May, 1900, in Sioux County. Instead of coming directly home from there I stopped off at Valentine, Cherry County, and visited another very interesting section of our state.

I suppose that not many members of the Union have had the pleasure of visiting that region, and perhaps as a result have only a vague idea of its appearance; so I will endeavor to give you a more definite picture of it.

Valentine is located in the northeast part of Cherry County, near Fort Niobrara. Like many other western towns it lies out on the open prairie unprotected from winds or sun. About two miles to the north, the north bluff of the Minnachaduza River rises high above the flat prairie in the foreground. Now and then a ledge of white limestone crops out, looking like snow from a distance. Many of the buildings in Valentine are built of stone quarried along this bluff. To the south a little farther away can be seen a few pine trees along the top of the bluffs of the Niobrara River. To the east and west the open prairies extend, amost as far as the eye can see. The locality chosen for my work was among a number of small lakes, about 30 miles south and west of Valentine. Having missed the stage going out in that direction, I would have been seriously delayed had it not been for the kindness of Professor Watson of the Valentine schools, through whom I secured transportation for myself and baggage on top of a wagonload of merchandise going out to a store at Simeon, a post office about 25 miles out in the Sand Hills.

About eight miles from town we crossed the Niobrara. The river here is a beautiful stream, perhaps 60 yards wide, running swift and clear between high bluffs which it has eroded in the Arikaree sands. We followed the river for about a mile before reaching a side canyon through which the steep bluff could be ascended. The part of the valley on either side of the river is thickly covered with low trees and bushes with now and then an occasional taller tree reaching above the rest. At the base of the bluff these give way to pine trees, which grow scatteringly along the face of the bluff. As we wound along the brush-lined road numerous birds were heard calling and singing. The mellow whistle of the Yellow-breasted Chat sounded above all others, except the "Bob-white" of the Quail. After a stiff pull up the side canyon the top of the bluff was reached. Here we stopped for a few minutes to rest the horses and to eat our lunch. The view was one of the prettiest I have ever seen, the air so clear that far-away objects were brought near. Looking toward the northeast Valentine rests on the prairie, a darker spot on a lighter-colored background; beyond and extending in an unbroken line as far as the eye can see toward the northwest is the north bluff of the Minnachaduza. To the west, and about four or five hundred feet below, the glistening river extends until lost to view behind a bend of the canyon. From a gnarled pine tree near by a Swainson's Hawk looks sleepily on, taking wing as we approach and joining a flock of Turkey Buzzards over the river for a moment before resting on a tree across the canyon. Looking in the opposite direction the faintly-marked trail is lost to view over the hills in the distance. We followed this trail for a number of hours before coming to Gordon

PLATE VIII

YOUNG ROSE-BREASTED GROSBEAKS
Male. October 14.

Creek. A short distance below where we crossed this stream, it flows into a canyon, but above this point it runs through a low, marshy country, now and then spreading out into a grass-filled lake, and again flowing through a narrow bed between low banks overhung by heavy slough grass. We followed up the Gordon till late in the afternoon, and then came in sight of a small cottonwood grove, the first timber seen since leaving the Niobrara River. These trees had been planted several years before by the man with whom I spent the night.

The birds observed along the way so far were:

Along the Niobrara: Bank Swallow, Rough-winged Swallow, Turkey Buzzard, Swainson's Hawk, Yellow-breasted Chat, Chewink, Quail, Spotted Sandpiper, Catbird, Orchard Oriole, Kingbird (also seen in cottonwood grove).

Along Gordon Creek: Killdeer, Bartramian Sandpiper, Blue-winged Teal, Mallard, Pintail.

Along road: Western Nighthawk, the most abundant bird seen, observed feeding all day; Lark Sparrow, Vesper Sparrow, Field Sparrow, Grasshopper Sparrow, Cowbird, Horned Lark, Meadowlark, Mourning Dove, Bobolink, Burrowing Owl.

In cottonwood grove and around ranchers' houses: Goldfinch, Baltimore Oriole, Barn Swallow.

The next day, June 3, I rode on to the lakes. The streams in the Sand Hills are for the most part few, but swift and clear, as streams in a new country are apt to be. The water flows over a stony bed. Cascades and falls are numerous, and some exceedingly pretty. One, on account of the fact that it is a plunge over an Arikaree limestone ledge, has been named by Professor Barbour of the State University the "Arikaree Falls."

In the Lake Region the drainage is imperfect, the water collecting in ponds and lakes in the lower eastern ends of the valleys. These valleys are often fifteen to twenty miles long, and are separated at the ends by low ranges of hills, and on the sides by steeper hills that are almost impassable by wagon. The bodies of water vary in size from small ponds to a lake five or six miles long by nearly two wide, and are thirty or more feet deep. Some are alkaline, while others are fresh, and although the water is warm it is not undrinkable. The alkaline lakes are for the most part free from everything except the minute forms of plant life, but the fresh-water lakes are full of vegetation. Trout Lake is one of this kind. Around this lake I did most of my work. The eastern end is comparatively free from reeds and rushes, while the western end is so full of them that it is almost impossible to force a boat through, since they grow very close and often to a height of from eight to ten feet. In the open water the bottom is entirely covered by Chara and other similar water plants.

The first nest that I found that was new to me was that of the Coot. It was in a small patch of rushes about thirty feet from the shore, and

was built upon a platform of broken-down rushes in water about two feet deep. The nest was constructed of the ends of bitten and broken-off rushes, and although the nest was quite deep, the base was about four inches from the water and dry. It contained seven eggs of the usual color. All of the fifty or more Coot's nests that I found were in about the same kind of a location, mostly, however, farther from the shore; were constructed of the same kind of rushes, and high and dry out of the water. The eggs varied in number from one to eleven, and in incubation from fresh to almost hatched. I did not see any young Coots.

The Pied-billed and Eared Grebes are also common breeders, the former the more abundant. Neither were breeding in colonies, the nests being widely separated. They were built upon floating platforms of rushes in the more open water and anchored to the living rushes. Nearly all of the nests of the Pied-billed Grebe that I found were so low down that the eggs were in water. Incubation was quite far advanced. The largest set taken was eight, the smallest, four. A young Pied-billed Grebe that I caught and now have mounted could not have been more than a few hours old; it was, when caught, at quite a distance from any nest, and I saw nothing of the parent birds. It is covered with soft down, in color uniform black, the breast, belly and chin whitish; along the body there are several stripes of whitish; also one through either eye and one over the eyes coming together at the base of the upper mandible. Near the base of the skull at the back of the head is a small patch of brown. The bill is large and shaped as in the old bird; the wing very small and weak; the feet large and strong, with serrulations as in the old bird. The Horned Grebe in this lake as a rule built higher out of the water but the nest does not differ materially from that of the Pied-billed Grebe. All the nests that I found of both birds had the eggs covered with wet rushes. Although I waited patiently for several hours I did not see the birds go to or from their nests.

The Forster's and Black Terns were common, there being about sixty pairs of the former and twenty of the latter around the one lake. The birds were gathered in a colony on the north side of the lake where the nests were placed on masses of rushes; the Forster's having taken the higher and more desirable spots, the Black being compelled, as the space was limited, to occupy the less desirable, where the eggs were frequently in water. In some cases quite a nest was built of rush stems and leaves, in others the cavity was shaped in the top of the floating mass of rushes. One set of four of the Forster's was taken, the number, however, usually being two or three. Incubation was well advanced, young birds being numerous; these were thickly covered with long down. The back irregularly marked with brown and black. The lower parts light brown. The wings, in marked contrast to those of the young Grebe, are long and strong. I found on putting a bird just out of the egg in the water that it at once began to swim. The Black Terns were

not so far along in incubation, fresh eggs being the rule. This bird seems to be more careless in building, not using as much material in constructing the nest as the Forster's.

In the taller canes near the shore the Long-billed Marsh Wrens were abundant, for although I could not see more than fifteen or twenty feet around me, I could quite often count ten or twelve of the spherical nests. On investigation, however, only one or two would have eggs in them, others being old, and still others seemingly having been built for practice. For the most part the clutches were incomplete, the birds not having commenced to set. The nests were all from three to five feet from the ground, were built of rushes and leaves closely woven together, a small opening being left for entrance, and fastened strongly to the reeds.

The Yellow-headed Blackbird here seemed to prefer a patch of rushes separated from the shore by a narrow strip of water. The nest was suspended between four or five rushes about eighteen inches from the water and was strongly built of rush leaves and stems. Few nests had eggs, the birds not having finished building.

The two Blue-winged Teal nests that I found were quite differently located. The one was about one hundred feet from the edge of the lake on high, dry ground, while the other was back in the hills nearly three-quarters of a mile from the water. I was surprised to find a nest so far from the lake but was told by settlers there that it was nothing unusual to find nests even two miles from water. The birds had scraped a shallow hole in the ground and lined it with grass and roots and a few feathers from their breasts. No covering was over either but the over-hanging grass so nearly concealed them that they could not be seen a few feet away. The birds both clung closely to the nest, one not leaving until my foot was nearly resting on her back. The first contained nine fresh eggs, the other twelve badly incubated ones.

My time was so limited that I could not work even the one lake as well as I would have liked to do, and as a result my list of breeders is not as large as it ought to be. The following list of birds observed will show a few that upon further investigation will probably be found to breed there:

Horned Grebe, several pairs; Ring-billed Gull, about ten pairs seen around an alkali lake; Mallard, common; Gadwall, common; Widgeon, common; Spoonbill, common; Pintail, common; Red-head, common; Canvas-back, about ten pairs were seen; Ruddy Duck, common on one lake; American Bittern, common; Black-crowned Night Heron, came to the lakes every night to feed, leaving about sunrise; Wilson's Phalarope, common, in going across a meadow several pairs would follow calling and crying as if their nest was near; Baird's Sandpiper, several seen; Semi-palmated Sandpiper, common; Least Sandpiper, common. This and the preceding were gathered in large flocks seemingly not having mated as yet. Avocet, one pair seen and the birds acted as if they had

a nest near; Belted Piping Plover, common; Sanderling, one bird seen; Sand-hill Crane, one pair; King Rail, several; Prairie Hen, common; Sharp-tailed Grouse, common; Red-winged Blackbird, breeds in numbers; Marsh Hawk, common; Maryland Yellow-throat, one seen among canes near Trout Lake.

NOTES ON BIRDS FROM WESTERN NEBRASKA

A. R. GRAVES, KEARNEY

69. *Sterna forsteri* Nutt.—Forster's Tern. Near Atkinson, August 2, 1892.
77. *Hydrochelidon nigra surinamensis* (Gmel.).—Black Tern. Kearney, August 18, 1899.
131. *Lophodytes cucullatus* (Linn.). Hooded Merganser. Swan Lake, Holt Co., September 10, 1891.
135. *Chaulelasmus streperus* (Linn.).—Gadwall. Kennedy, Cherry Co., November 7, 1891.
137. *Mareca americana* (Gmel.).—Baldpate. Ewing, April 19, 1892.
139. *Nettion carolinensis* (Gmel.).—Green-winged Teal. Phillips, June 24, 1891.
142. *Spatula clypeata* (Linn.).—Shoveller. Bassett, April 23, 1892.
143. *Dafila acuta* (Linn.).—Pintail. Kearney, March 23, 1892.
149. *Aythya affinis* (Eyt.).—Lesser Scaup Duck. Ewing, April 19, 1892.
153. *Charitonetta albeola* (Linn.).—Buffle-head. Kennedy, November 7, 1891.
167. *Erismatura jamaicensis* (Gmel.)—Ruddy Duck. Bassett, April 23, 1892.
190. *Botaurus lentiginosus* (Montag.). Bittern. Bassett, September 9, 1891.
230. *Gallinago delicata* (Ord.).—Wilson's Snipe. Kennedy, April 25, 1892.
241. *Tringa bairdii* (Coues).—Baird's Sandpiper. Kearney, August 18, 1899.
248. *Calidris arenaria* (Linn.).—Sanderling. Alliance, April 6, 1892.
255. *Totanus flavipes* (Gmel.).—Yellow-legs. Kennedy, April 27, 1892.
256. *Helodromas solitarius* (Wils.). Solitary Sandpiper. Chapman, June 30, 1891.
258*a*. *Symphemia semipalmata inornata* Brewst.—Western Willet. Watt's Lake, Cherry Co., May 30, 1893.
264. *Numenius longirostris* Wils.—Long-billed Curlew. Kennedy, April 28, 1892.
270. *Squatarola squatarola* (Linn.).—Black-belied Plover. Atkinson, October 9, 1893.
273. *Ægialitis vocifera* (Linn.).—Killdeer. Chapman, June 30, 1891.
289. *Colinus virginianus* (Linn.).—Bob-white. Kearney, July 7, 1892.
307. *Tympanuchus pallidicinctus* Ridgw.—Lesser Prairie Hen. Bassett, September 9, 1891.
308*b*. *Pediocœtes phasianellus campestris* Ridgw. Prairie Sharp-tailed Grouse. Kennedy, April 25, 1892.
316. *Zenaidura macroura* (Linn.).—Mourning Dove. Doniphan, June 23, 1891.
331. *Circus hudsonius* (Linn.).—Marsh Hawk. North Platte, September 4, 1893.

367. *Asio accipitrinus* (Pall.).—Short-eared Owl. Kennedy, February 1, 1893.

378. *Speotyto cunicularia hypogæa* (Bonap.).—Burrowing Owl. September 12, 1891.

387. *Coccyzus americanus* (Linn.).—Yellow-billed Cuckoo. Arborville, June 30, 1891.

406. *Melanerpes erythrocephalus* (Linn.).—Red-headed Woodpecker. Chapman, June 30, 1891.

412*a*. *Colaptes auratus luteus* Bangs.—Flicker. Shelton, July 1, 1891.

420*a*. *Chordeiles virginianus henryi* (Cass.).—Western Nighthawk. Atkinson, August 1, 1892.

444. *Tyrannus tyrannus* (Linn.).—Kingbird. Marquette, June 24, 1891.

474*a*. *Otocoris alpestris leucolæma* (Coues). Pallid Horned Lark. Kearney, February 26, 1892.

474*b*. *Otocoris alpestris praticola* Hensh.—Prairie Horned Lark. Shelton, July 1, 1891.

477. *Cyanocitta cristata* (Linn.).—Blue Jay. Valentine, September 7, 1891.

495. *Molothrus ater* (Bodd.).—Cowbird. Chapman, June 30, 1891.

497. *Xanthocephalus xanthocephalus* (Bonap.).—Yellow-headed Blackbird. Swan Lake, September 11, 1891.

498. *Agelaius phœniceus* (Linn.). Red-winged Blackbird. Arborville, June 27, 1891.

501*b*. *Sturnella magna neglecta* (Aud.). Western Meadowlark. Arborville, June 24, 1891.

511*b*. *Quiscalus quiscula æneus* (Ridgw.).—Bronzed Grackle. Arborville, June 26, 1891.

529. *Astragalinus tristis* (Linn.).—American Goldfinch. Valentine, September 7, 1891.

559*a*. *Spizella monticola ochracea* Brewst.—Western Tree Sparrow. Kennedy, March 1, 1893.

583. *Melospiza lincolnii* (Aud.). Lincoln's Sparrow. Swan Lake, September 11, 1891.

588. *Pipilo maculatus arcticus* (Swains.).—Arctic Towhee. Valentine, September 7, 1891.

604. *Spiza americana* (Gmel.).—Dickcissel. Kearney, July 4, 1892.

613. *Hirundo erythrogastra* Bodd. Barn Swallow. Arborville, June 26, 1891.

622*a*. *Lanius ludovicianus excubitorides* (Swains.).—White-rumped Shrike. Kennedy, April 29, 1892.

703. *Mimus polyglottos* (Linn.).—Mockingbird. Kearney, July 13, 1899.

705. *Harporhynchus rufus* (Linn.).—Brown Thrasher. Arborville, June 27, 1891.

715. *Salpinctes obsoletus* (Say).—Rock Wren. Johnstown, September 8, 1891.

758*a*. *Hylocichla ustulata swainsoni* (Caban.). Olive-backed Thrush. Kearney, May 31, 1900.

ON MIGRATION RECORDS AND ON OUR NEBRASKA RECORDS

R. H. WOLCOTT, LINCOLN

At the previous meeting of this Union the author presented a paper containing a proposed scheme for the accurate numerical evaluation of terms relating to the abundance of species, and for an accurate and uniform method of recording migration observations. The experience of the past spring has proven the scheme there presented to be feasible, but has also shown the necessity of certain modifications. With these and with other suggestions concerning the matter of records it is proposed in this paper to deal.

First, the width of the strip included within the scope of observation must be taken into account, and it is evident to any one who attempts to put the scheme into operation that the width of the strip which may be included varies with the different species, with the character of the locality, and with the ability of the observer. Those birds which are small, dull-colored, secretive in their habits, and which remain quiet, require close observation; in the case of those species which are large, brilliant, noisy, and conspicuous in every way it is comparatively easy to detect every individual even to a considerable distance. The author would suggest, to obviate this difficulty, that a strip of uniform width, say 100 yards, should be taken as a standard and that each person apply the corresponding corrections necessary to place each species on the same plane.

For instance one observer might be able to enumerate the smaller sparrows or other small birds for a strip only 50 yards wide, the robins in one 200 yards wide, the crows in one a quarter of a mile wide. He would have to multiply the first figures by 2, and divide the others by 2 and 4.4 respectively. Thus reduced the figures would indicate exactly the ratio of abundance.

It also became evident to the writer from his experience the past season that in many places the method suggested, of enumerating all individuals included within a strip of given width, was not applicable, but that it might be desirable to select given areas chosen with reference to securing the greatest variety of conditions, with reference to the possibility of exact limitation, and with reference to the greatest possible accurate estimation of the birds included therein, and to go over these areas, carefully estimating the total number present in the area selected. In this case comparison would have to be made with some unit of area. The object in proposing the scheme which was suggested was to suggest certain expedients whereby the observation of bird migration could be made more accurate, and the results of different observers become comparable. The methods proposed will have to be modified to suit the character of the locality and the ability of the observer. Some modification, however, it is believed

can be applied by any one, and will conduce to consistency and accuracy in the recording of observations.

The writer had hoped to apply the proposed scheme in the following out of a series of daily observations, but many things interfered with the carrying out of this plan, and it was only possible to make occasional observations as opportunity offered, which might be used in estimating the value of the scheme. On these occasions the following data were carefully noted: the date; the character of the day, including the state of the weather, the temperature, and the direction of the wind; the character of the previous day's weather; the exact route followed with the distance covered, as closely as it could be estimated; a careful description of the territory covered; and the hours during which the record was made. The following two reports will serve as samples:

I.

Date—April 5, 1900.

Character of the Day—Clear. Minimum temperature, 31°, at 6:45 a. m.; maximum, 72°, at 4:30 p. m.; wind southeast; maximum velocity, 22 miles.

Character of Previous Day—Clear. Maximum temperature, 59°, at 4:30 p. m.; wind southeast; maximum velocity, 25 miles.

Route—From Insane Asylum to Denver line B. & M. Ry.; along this to Yankee Hill Brickyard; along Haines' Branch to a point one mile east of Denton.

Territory—A level road between a cornfield and pasture, with a clump of trees at one place; railway track bordered by pasture land; creek with thin fringe of timber here and there, occasional clumps of bushes, and open field; at one point a few small ponds. General character of country very open.

Time—7:30 to 11:30 a. m.

Width of Strip—200 yards.

Distance—About 7 miles.

	No. of birds seen	Ratio per mile
Bronzed Grackle (in small flocks)	21	3.0
Phœbe	3	0.4
Chickadee	9	1.3
Tree Sparrow (flock)	12	1.7
Robin	10	1.4
Yellow-shafted Flicker	11	1.6
Crow	6	0.9
Western Meadowlark	22	3.1
Prairie Horned Lark	6	0.9
Song Sparrow	8	1.1
Black-crowned Night Heron (one flock)	3	0.4
Mourning Dove (pair)	2	0.3
Blue-winged Teal (flock)	12	1.7
Baird's Sandpiper (flock)	9	1.3
Killdeer (pair)	2	0.3
Green-winged Teal (pair)	2	0.3
Goldfinch	24	3.4
Red-winged Blackbird	7	1.0
Bluebird	1	0.1
Harris's Sparrow (flock, estimated)	25	3.5

II.

Date—April 14, 1900.

Character of the Day—Cloudy, with an occasional sprinkle. Minimum temperature 50°, at 5:00 a. m.; maximum, 63°, at 4:00 p. m.; wind south; maximum velocity, 14 miles.

Character of the Previous Day—Clear. Maximum temperature 66°, in afternoon. Wind northwest; maximum velocity, 14 miles.

Route—Bank of Salt Creek, from Branson's Farm to Wagner's and again from the bend north of the next section line to the end of the first wooded bend below.

Territory—Continuous timber along the creek, except for a short strip where the creek was bordered by a few scattering trees and by an extensive tract of shrubbery and young oaks.

Time—6:30 a. m. to 10 a. m.

Width of Strip—About 100 yards.

Distance—Two miles.

	No. of birds seen	Ratio per mile
Bronzed Grackle	16	8.0
Phœbe	2	1.0
Chickadee	12	6.0
Field Sparrow	1	0.5
Robin	9	4.5
Yellow-shafted Flicker	13	6.5
Crow	10	5.0
Common Junco (flock)	19	9.5
Downy Woodpecker	2	1.0
Song Sparrow	7	3.5
Cowbird	10	5.0
Chewink	10	5.0
Blue-winged Teal (pair)	2	1.0
White-breasted Nuthatch	2	1.0
Fox Sparrow (scattered flock)	15	7.5
Bluebird	2	1.0
Harris's Sparrow (flock, estimated)	50	25.0

The meteorological data in each case are from the official records of the weather office here. To compare the two tables the ratio in the first should be divided by 2, or those in the second multiplied by the same figure. The two present a sharp contrast in the character of the localities. It is believed that the maximum value could be derived from a series of daily records secured from the covering of the same strip each day.

It has become evident from the writer's experience the past season that the practical application of this scheme is only advisable in case the person using it is familiar with the birds of his locality, and accustomed to habits of close observation. Even to such the work is laborious, and only practice can lead to results which approximate accuracy, but a limited number of observers who can and would apply the method suggested could secure data which it seems would be of such great value as to justify the time spent in obtaining them.

Since the object of the scheme referred to above is to secure the utmost accuracy in the recording of migration records it has seemed

PLATE IX

YOUNG ROSE-BREASTED GROSBEAKS
Female. October 21.

proper to the writer that the matter of accuracy in regard to other records might very properly be dealt with at this time. To any one who has had occasion to use local lists of birds, and even state lists, it is very evident that perfect accuracy in observation and perfect honesty of judgment is a rare quality. It is too easy to jump at conclusions, and too difficult, if records are not kept with the utmost care, to forget within a brief space of time the actual facts and be content with an approximation. Too frequently in the case of a list its author is influenced by the judgment of those whose experience and knowledge are greater than his own, but whose work has been done at localities more or less removed, and who are less competent than he to judge, while, on the other hand, many authors of such lists are too ready to record observations that conflict with all that is known regarding the distribution of certain species, owing to ignorance of the factors that enter into the distribution of a given species, and their inability to judge of the possibility of extension in the range of the species and of the amount of elasticity to which under certain conditions the limit of range may be subject.

We live in a state in which, more than in almost any other, the greatest possible care must be taken in regard to the making of records. Our faunal position is such that within our borders is a remarkable mingling of species from different faunal regions; here the eastern and western subspecies meet; here is a transition from the smaller, shorter-tailed and darker eastern forms to the larger, longer-tailed and paler birds characteristic of the plains. And when we turn to the books we are met by the, to us, meaningless "West to the edge of the Great Plains," or "From the Plains to the Pacific." We must settle ourselves the problems which we see facing us.

These problems must be met and answered in a spirit of scientific accuracy, if our conclusions are to carry weight with those living outside our borders. We must know what we know and record only what we know we know. We must be open at all times to conviction, but at the same time we must subject every fact presented to the most thorough criticism. As a society we must judge kindly, but most critically with the records presented by our members for our consideration. To the end that these records may be judged most fairly the writer has already urged the appointment of a record committee and presented a set of rules to govern the action of the same, and the Union has seen fit to accept the suggestion and to adopt the rules.

These rules are expected to be applied to the judging of future records. What we have now we must accept as "stock in hand"—some good, some bad, but all held for what they are worth till in the light of our own knowledge we can judge them. The first list of our birds, published by Samuel Aughey in the Report of the U. S. Entomological Commission for 1877, was the work of a pioneer, of whom it was de-

manded that his teaching cover the whole range of physical and biological sciences, and whose work in the light of the conditions under which he worked was well done. Many of his identifications have been rendered invalid by the changes in nomenclature since his day, but this need cause no confusion. W. E. Taylor, in the Report of the State Board of Agriculture for 1887, and also, in the "Ornithologist and Oologist" for 1888, published lists of Nebraska Birds which added to the number recorded for the state, but which could have been made of far greater value had the author distinguished more carefully between his own knowledge and inferences from the work of others and from statements made in general works on the subject. In 1896 Professor Bruner compiled the list of our birds which we are at present using as the basis of our work. His work was done with characteristic energy and resulted in the accumulation of a remarkably large number of records obtained from observers all over the state. He made no attempt, however, to estimate the value of the various statements made, but limited his duties to those of a compiler, and part of our work is now to judge the material he has accumulated and in the knowledge gained by our own efforts find means of separating the false from the true. It is fitting that we should acknowledge the great value of the work Professor Bruner has done; it may also hasten the progress of the work we have to do if we place definitely before ourselves the questions suggested by his work and which we must solve.

The following birds included in the list have never been reported as taken within the present limits of Nebraska, though some of them were reported from "Northwest Nebraska" at a time when "Nebraska" included most of what is now Montana and Wyoming:

62. Sabine's Gull.
297*b*. Richardson's Grouse.
373*c*. Rocky Mountain Screech Owl.
549.1. Nelson's Sparrow.
554*b*. Gambel's Sparrow.
578. Cassin's Sparrow.
590. Green-tailed Towhee.
719*b*. Baird's Wren.
738. Mountain Chickadee.
761*a*. Western Robin.
767. Western Bluebird (Bruner cites Aughey in error).

The following were introduced into the list on erroneous identifications:

511. Purple Grackle.
528*b*. Greater Redpoll.
675. Water Thrush (Aughey's record antedates the separation of Grinnell's Water Thursh, which is our form).

The following birds are included on evidence which is doubtful and their right to a place in our list has not since been verified:

47. Great Black-backed Gull.

71. Arctic Tern.
121. Mexican Cormorant.
188. Wood Ibis.
278. Snowy Plover.
286. American Oystercatcher.
328. White-tailed Kite.
329. Mississippi Kite.
334*a*. Western Goshawk. (The specimen was taken and has been seen by both Prof. Bruner and Merritt Cary, but the identification has not been verified.)
375*c*. Dusky Horned Owl.
392. Ivory-billed Woodpecker.
393*c*. Northern Hairy Woodpecker.
480. Woodhouse's Jay.
568. Pink-sided Junco.
585*c*. Slate-colored Sparrow.
630. Black-capped Vireo.
663*a*. Sycamore Warbler.
702. Sage Thrasher. (Has been found nesting in Wyoming, within half a mile of the Nebraska line.)
729. Brown-headed Nuthatch.
740. Hudsonian Chickadee.
757. Gray-cheeked Thrush.

The following should be changed:

394*a*. Gairdner's Woodpecker, to 394*b*. *Dryobates pubescens homorus* (Cab.), the suspicion expressed by Prof. Bruner in his list having proven correct.

The following birds have been reported but once or twice, and further records of occurrence are very desirable:

2. Red-necked Grebe.
118. Anhinga.
126. Brown Pelican.
186. Glossy Ibis.
203. Yellow-crowned Night Heron.
215. Yellow Rail.
216. Black Rail.
218. Purple Gallinule.
247. Western Sandpiper.
326. Black Vulture.
354*a*. Gyrfalcon.
370. Great Gray Owl.
371. Richardson's Saw-whet Owl.
377*a*. Hawk Owl.
443. Scissor-tailed Flycatcher.
478*c*. Black-headed Jay.
518. Cassin's Purple Finch.
521*a*. Mexican Crossbill.
562. Brewer's Sparrow.
567*b*. Shufeldt's Junco.
569. Gray-headed Junco.
642. Golden-winged Warbler.
644. Virginia's Warbler.
650. Cape May Warbler.

654. Black-throated Blue Warbler.
660. Bay-breasted Warbler.
671. Pine Warbler.
672. Palm Warbler.
680. Macgillivray's Warbler.
684. Hooded Warbler.
686. Canadian Warbler.
718. Carolina Wren.
719. Bewick's Wren.
726*b*. Rocky Mountain Creeper.
730. Pygmy Nuthatch.

The distribution of the eastern and western forms of the following must be determined:

420. Nighthawk.
540. Vesper Sparrow.
542*a*. Savanna Sparrow.
546. Grasshopper Sparrow.
554. White-crowned Sparrow.
559. Tree Sparrow.
563. Field Sparrow.
597. Blue Grosbeak.
681. Maryland Yellow-throat.
683. Yellow-breasted Chat.
727. White-bellied Nuthatch.
735. Chickadee.

The following need investigation:

358. Richardson's Merlin. "Rather common in Nebraska, breeds here"—Aughey; "Resident, common"—Taylor; "West Point, Omaha"—Bruner. Not reported by other observers—nor for years past. Was it formerly common? And is it now rare or absent?

405*a*. Northern Pileated Woodpecker. Is it still present? None have been reported for several years.

462. Western Wood Pewee—"Omaha—breeds" (L. Skow). This seems to have been an error, and its distribution in the western part of the state is uncertain.

474 and vars. Horned Larks. Our records concerning these birds are much confused. Too much stress has been laid on the color of the throat and other variable characters. The writer has seen specimens from Omaha labelled "Pallid Horned Lark" that were simply the Prairie form with hardly a trace of the yellow of the throat. Apparently the Prairie Horned Lark (474*b*) is resident in Eastern Nebraska and the Desert Horned Lark (474*c*) in the western part of the state, while the typical Horned Lark (474) is occasionally found in Eastern Nebraska in winter, and the Pallid or White-throated Horned Lark (474*a*) comes into the state in winter from the northwest.

484. Canada Jay. Which form?

486. Raven. Do the records refer to the American or the Northern?

501 and 501*b*. Meadowlark and Western Meadowlark. When the records are sifted it becomes apparent that most, if not all of them, refer to the Western form. If the Eastern Meadowlark occurs in the state it is but rarely and in the easternmost portion.

567*a*. Oregon Junco. The check-list assigns this bird to the Pacific Coast, but specimens are taken in Northwest Nebraska which seem to be clearly of this variety.

622. The smaller Shrikes. Most of our birds are the White-rumped but we also seem to have the Migrant Shrike, as defined by Palmer, in the eastern part of the state.

721. House Wren. Both the Eastern and Western House Wrens are recorded but as evidence accumulates it begins to be very doubtful if we have any that can be referred to the eastern form.

To the list the following have been added:

163. American Scoter (Lincoln).
627*a*. Western Warbling Vireo (Sioux Co.).
629*a*. Plumbeous Vireo (Sioux Co.).

The range of the following species is such that they can be looked for within the state:

9. Black-throated Loon (in winter).
37. Parasitic Jaeger (in migrations).
38. Long-tailed Jaegar (in migrations).
40. Kittiwake (in winter).
42. Glaucous Gull (in winter).
43. Iceland Gull (in winter).
65. Royal Tern (in summer).
172*c*. Cackling Goose (in migrations).
184. White Ibis (in summer, in southeast part of the state).
199. Louisiana Heron (in summer in Southeast Nebraska).
222. Red Phalarope (in migrations).
235. Purple Sandpiper (in migrations).
256*a*. Western Solitary Sandpiper (in Western Nebraska).
297. Dusky Grouse (in the Northwest).
300*b*. Gray Ruffed Grouse (in the Northwest).
416. Chuck-wills' Widow (in Southern Nebraska, in summer).
420*c*. Sennett's Nighthawk (in migrations).
433. Rufous Hummingbird (in Southwest).
448. Cassin's Kingbird (in Western Nebraska).
454. Ash-throated Flycatcher (in western portion).
464. Western Flycatcher (in western part of state).
468. Hammond's Flycatcher (western).
484*a*. Rocky Mountain Jay (in West Nebraska).
486*a*. Northern Raven (in northwest).
515*a*. Rocky Mountain Pine Grosbeak (in Northwest Nebraska).
530. Arkansas Goldfinch (in Southwest Nebraska).
536*a*. Alaskan Longspur (in western part of the state).
547*a*. Western Henslow's Sparrow (western part).
552*a*. Western Lark Sparrow (westward).
567.1. Montana Junco (in winter).
581*j*. Dakota Song Sparrow.
668. Townsend's Warbler (in Western Nebraska).
678. Connecticut Warbler.
717*a*. Canyon Wren (in west part of state).
756*a*. Willow Thrush (western).
759*a*. Audubon's Hermit Thrush (western).

It is hoped by thus putting clearly before ourselves the problems to be solved we may the sooner prepare for the publication of a critical revision of the list of Nebraska birds.

IN MEMORIAM—MARTIN LUTHER EATON

R. H. WOLCOTT, LINCOLN

One of the duties of a society is to perpetuate the memory of those who have labored to advance the cause the furtherance of which is the aim of the society, and it is in fulfillment of that duty that this biography is written. And no one will regret more than the writer that its preparation has been the lot of one who did not enjoy the personal acquaintance of him to whom these pages are dedicated.

Martin Luther Eaton was born at Salem, Washtenaw county, Michigan, November 14, 1847. His father, Rev. C. H. Eaton, was a native of Vermont, and a Congregational minister, who moved to Viola, Illinois, in 1861, where the boyhood of Martin was passed. In 1875 he taught a country school near New Boston, Illinois, and later another school in Iowa, while at the same time preparing for college. He entered the preparatory department of Tabor College, Iowa, in 1876, and in the fall of 1878 became a student in Iowa College, Grinnell, Iowa. From this college he was graduated in June, 1882, with the degree of A. B., and entered the following fall the Medical Department of the University of Michigan at Ann Arbor, from which institution he received his degree of M. D. in June, 1885, graduating as president of his class. The following year he spent with the family, who were then living in Arkansas, and on the death of his mother in May, 1886, he went to Fairbury, Nebraska, and engaged in the practice of medicine. In August of this year he was married and his wife and son, who survive him, are at present living in Lincoln, Nebraska. His death occurred at Fairbury, February 12, 1894, at the age of thirty-six years and three months.

As a physician Dr. Eaton was possessed of a degree of skill which promised to bring him fame in his chosen profession. He was prominent in business, political, and social circles, and served one term as mayor of the city of Fairbury. He also served as staff officer in the war of the Ghost Dance in the Bad Lands in 1890 and 1891. He was of an intensely nervous temperament, a deep student, and possessed of high aspirations. Always modest and unassuming, he was possessed of great energy, and did his work with the utmost system and thoroughness. As a child he was inquisitive, and early developed a taste for natural history, beginning at first to collect moths, bugs, and butterflies. Later he turned to taxidermy, and devoted himself especially to the collecting of birds, of which he gathered many in Michigan, in Arkansas, during his year of residence and the winter vacation of the year preceding, and later, in Nebraska, while engaged in the practice of his profession. He also turned his attention to geology, the study of which he prosecuted with his usual energy. While at Fairbury he suffered the loss of his collections by fire, but a collection of birds and Indian relics at present deposited in the University of Nebraska, and a similar collection which

is deposited in Iowa College at Grinnell, Iowa, remain to attest the energy with which he devoted himself at all times to his scientific studies and with which he began a collection to replace that lost. The first of these collections the writer has had the privilege of examining, and it is to be regretted that the second has not also been included in this examination. The specimens represent material gathered at Ann Arbor during his residence there, at Hazen, Arkansas, at Fairbury, and also a few specimens evidently obtained by exchange from others. It is to be regretted that only the specimens gathered previous to his removal to Nebraska are accompanied by any data. Busy with his professional duties and only able to turn at spare moments to his natural history he delayed the affixing of labels to specimens, especially those gathered at Fairbury, until it was too late, and though every expedient has been resorted to which it is possible to apply, in the endeavor to determine the locality from which the unlabelled specimens came, the effort has proven futile. Of interest to all ornithologists is the presence in the collection of several specimens of Pileated Woodpecker from Hazen, Arkansas, taken December 22 and 23, 1884, and January 6, 1885, while of especial interest to Michigan ornithologists is a specimen of the Arctic Three-toed Woodpecker labelled "Picoides arcticus (male), Ann Arbor, Mich., October 18, 1884."

Dr. Eaton is responsible for several records in Professor Bruner's "Notes on Nebraska Birds," and the amount of work which he accomplished at spare moments during his brief residence in the state testifies eloquently to the loss which Ornithology suffered in his early death.

MISCELLANEOUS NOTES

NOTES FROM LINCOLN

On the 22d of January, 1900, while out collecting near Lincoln, I saw a small flock of Bronzed Grackles. It was not possible to secure a specimen but the birds were clearly seen and I am positive of the identification.

June 15, 1900, I took a set of twenty-five Quail's eggs, of which all but one, a runt, were nearly of the usual size. The eggs vary in measurement from 0.89 by 1.14 to 0.95 by 1.26 of an inch, the average being 0.93 by 1.19. The runt is 0.65 by 0.77 of an inch.

I saw Hooded Mergansers nearly every day that I was out toward the lake near Lincoln during the past summer. A brood of about half-grown young was seen August 2, 1900.

During the winter of 1898, there were large numbers of Pine Finches near Lincoln. They have been reported but once or twice since.

J. S. HUNTER, Lincoln.

BREEDING OF THE SNOWY HERON AND SWALLOW-TAILED KITE

In June, 1895, a pair of Snowy Herons (*Ardea candidissima* Gmelin) bred on Oak Creek, a mile from Salt Lake and about three miles northwest of Lincoln. The nest, which was in the timber, on an over-hanging limb, fifteen feet above the middle of the stream, was discovered by two boys who shot into it, destroying it and the eggs and killing the female. This bird was brought to me to be mounted and is now in my collection. In August of the same year another bird of this species was seen a short distance farther up the creek, which was probably the mate.

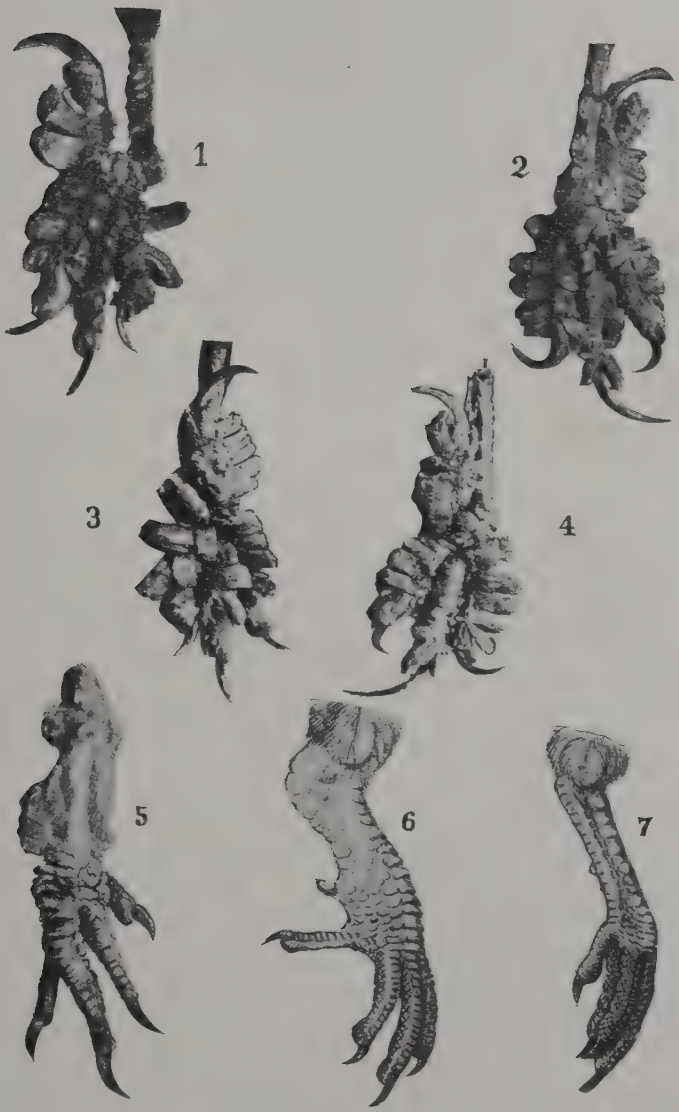
On the 8th of August, 1896, a pair of Swallow-tailed Kites were brought to Lincoln by a man who had shot them near Greenwood, where, he said, they had been nesting. The male I secured and it is now in my collection. The female was taken to the University, where it fell into the hands of the Art Department, and after being used as a subject for sketching was thrown away.

AUGUST EICHE, Lincoln.

NASHVILLE WARBLER

June 11, 1900, while collecting on an island in the Missouri River opposite Nebraska City, I shot a female Nashville Warbler with eggs in her ovary which were from 2 mm. to 3 mm. in diameter. The bird flushed from a tangled mat of vegetation, consisting of marsh grass and sedges, bordering a slough and surrounded by swamp willows. The peculiar manner in which a bird flushes when coming from a nest was evident

PLATE X



A DISEASE OF BIRDS' FEET

in her actions; but although I searched closely I was unable to locate one. This was not good evidence, however, that no nest existed, for the nature of the cover made it highly improbable that I should have found it.

M. A. Carriker, Jr., Nebraska City.

YELLOW-THROATED VIREO

This Vireo is a frequent breeder in the vicinity of Nebraska City, frequenting almost exclusively, as far as I know, the large apple orchards numerous about here. On June 6, 1897, I found a nest in the top of a thick-leaved apple tree, containing three fresh eggs, and June 11, 1898, another in a similar location with four eggs partly incubated. The nest resembles that of the Warbling Vireo, except that it is very much prettier and more compactly built.

Two broods are raised in a season. There is never more than one pair of birds to an orchard, and they are easily located by their constant singing. The nest, however, is extremely hard to find, for out of the many pairs of birds I have located, I have never been able to find more than the two nests mentioned which contained eggs. However, I have found them on several instances with young in July, which shows that two broods are reared.

M. A. Carriker, Jr., Nebraska City.

NOTES FROM OMAHA

Old Squaw Duck (*Clangula hyemalis*). Two specimens of this bird were killed on Cut-off Lake near this city December 8, 1900, by a local sportsman. He had never seen this species before, brought the heads to me to identify, and I have them now in my possession.

White-Winged Scoter (*Oidemia deglandi*). I have one of these ducks which was killed on Cut-off Lake, December 8, 1900.

Tufted Titmouse (*Parus bicolor*). One was killed by L. Skow near Florence, October 5, 1900.

Evening Grosbeak (*Coccothraustes vespertinus*). A specimen was killed by L. Skow near Florence, October 12, 1900. The heads and wings of two were also brought by a local sportsman (?) to R. F. Mullen during the first week of November, 1900.

Blue-Gray Gnatcatcher (*Polioptila cærulea*). Two nests containing three and four eggs respectively were found near Bellevue in June, 1900. F. H. Shoemaker and I. S. Trostler photographed one of these after the young were hatched.

Yellow-throated Vireo (*Vireo flavifrons*). R. F. Mullen found a nest and four eggs of this species near Bellevue in June, 1900.

Cerulean Warbler (*Dendroica cærulea*). I found three nests of this species in 1900 near Bellevue. One contained four badly incubated eggs, the second a young bird, the third three slightly incubated eggs.

J. E. Wallace, Omaha.

BLACK-HEADED GROSBEAK (*Habia melanocephala*)

One day last summer, while taking a ramble along the Middle Loup River I found a nest of the Black-headed Grosbeak. The female was sitting on the nest, and did not leave it until I was within a few feet of the place; then she slid off to one side, and was soon joined by her mate. They made quite a racket while I was examining their nest. It was situated in the top branches of a white-willow about six feet from the ground; nest composed of willow-twigs, grasses, and rootlets, loosely put together. It contained two fresh eggs, in size and coloration similar to those of the Rose-breasted Grosbeak. As the set was incomplete, I left them with the intention of returning in a few days and take it when complete. But almost two weeks passed before I got a chance to look after the nest and then it contained four eggs, with incubation too far advanced to allow of blowing. So I left the nest and eggs to the care of the parent birds and noticed with pleasure about six weeks afterward that there were now six Black-headed Grosbeaks instead of two. They are not scarce at this locality.

GEO. P. ANDERSON, Dannebrog, Howard Co.

NESTING OF THE PLUMBEOUS VIREO IN SIOUX COUNTY

On the 27th of May, 1899, while encamped in Monroe Canyon, Sioux County, the writer discovered the nest of this vireo in a small box elder fifteen feet from the ground. The bottom of the canyon at that point is about a hundred yards wide with a small stream and full of shrubbery with a few older trees and many young poplar and box elder saplings. At one side of the winding road a young but crippled box elder with a trunk six inches in diameter, stood leaning, with its largest branch running off in a horizontal direction on the farther side. Out on this in a clump of twigs and leaves and suspended in the fork of a small branch just off the larger one, was the nest, unfinished when first found, lacking still the lining and external decoration. The birds were very tame and allowed of close and repeated observation. Other specimens were shot by others in the party in the immediate vicinity and thus the species positively identified; their collecting, however, was the source of much anxiety to me until I found that neither of "my birds" were the victims. On my departure, on the 30th, the nest was just done, ready for eggs, and a dainty structure it was, deep and purse-shaped, its contracted opening with neatly rounded margins, its surface decorated with cottony down and spider webs, and with just enough down in the bottom to make it soft to the little ones. The walls were not thick but close and firm, and woven, for the most part at least, of fine grasses. The structure was not molested, but the owners left to rear their young and many times afterward did I think of the little home off there in Sioux County and wonder how the family were doing.

ROBT. H. WOLCOTT, Lincoln.

ADDITIONAL NOTES ON BIRDS OF THE UPPER ELKHORN VALLEY

Since my list of the "Birds of the Upper Elkhorn Valley" appeared in the Proceedings of the First Annual Meeting, I have noted several additional species at Neligh, some of which are especially interesting. They are as follows:

54. *Larus delawarensis* Ord.—Ring-billed Gull. Four of these birds were seen on March 28, 1900, and again a large flock going south across the Sand Hills July 16, 1900.

59. *Larus franklinii* Sw. & Rich.—Franklin's Gull. A common migrant in the spring of 1900; April 17 to May 17.

343. *Buteo platypterus* (Vieill.).—Broad-winged Hawk. Four of these hawks were seen and one secured April 26, 1900. The birds were flying northward at the time.

546*a*. *Ammodramus savannarum perpallidus* (Coues).—Western Grasshopper Sparrow. A single specimen was secured May 5, 1900.

588. *Pipilo maculatus arcticus* (Swains.).—Arctic Towhee. A specimen of this Towhee was taken April 27, 1900, and a number seen.

593. *Cardinalis cardinalis* (Linn.).—Cardinal. Mr. J. P. Campbell of Newcastle, Wyo., informs me that he saw several of these birds at Neligh in the winter of 1893. As he was well acquainted with the Cardinal in the east, I have no hesitancy in accepting his identification.

647. *Helminthophila peregrina* (Wils.).—Tennessee Warbler. A common migrant in the spring of 1900; May 8 to 16.

In my former paper I listed the Meadowlark and House Wren. I have since become convinced that it is the western form of each of the above-mentioned species that we have in Nebraska. There has never to my knowledge been any definite record of the taking of either typical *Sturnella magna* or *Troglodytes ædon* within the state. In the above paper, then, the Western Meadowlark (*Sturnella magna neglecta*), and Western House Wren (*Troglodytes ædon aztecus*), should be substituted.

MERRITT CARY, Neligh.

SOME LINCOLN RECORDS

A male Lazuli Bunting was shot, May 6, 1899, in the timber fringing Salt Creek at a point about two miles south of Lincoln, and the skin is in the collection of the Union.

On April 28, 1900, a female Purple Finch was secured from the tips of the elms in which it was feeding. The skin is also in the collection of the society.

A flock of American Crossbills was seen daily by Mr. August Eiche feeding in a patch of dead sunflowers near his home in East Lincoln "for several days" previous to September 26, 1898, and they remained in the vicinity all winter. On March 8, 1899, a small flock also made its appearance on the capitol grounds, feeding from the pine-cones of the trees there. Here the birds remained and were seen daily till May 25,

when the writer left the city. They appeared to pair early in May and were usually seen thereafter, a male and a female together. Other flocks were reported during the winter and on April 6 the timber along Salt Creek south of the city was alive with the birds—during the whole day spent in exploring along the creek for a distance of two miles, they were rarely out of sight or hearing.

The Turnstone was first seen and collected on the Salt Basin near Lincoln on May 16, 1895. Since then it has been noted on the following dates: May 25, 1895; May 23, 1896; April 30, 1898; May 22, 1899; May 10, 1900. It has not so far been seen in the Fall.

On the 29th of June, 1900, Mr. J. S. Hunter and the writer visited Salt Lake and the "Sloughs" near it, west of Lincoln, and observed the following species: one Ruddy Duck on the lake, probably a crippled bird; a male Spoonbill, the mate of which was doubtless on her nest in the vicinity; a flock of six Hooded Mergansers, which arose from the lake and flew close over our heads; three Yellow-legs, on the shore of the lake; a Gull, without much doubt the Ring-billed, flying over the water; two Baird's Sandpipers, about a pond on the "Slough;" three Blue-winged Teal, on the "Slough;" and a flock of Yellow-headed Blackbirds, at the same place. Of all these, only the Spoonbill and Blue-winged Teal have ever been known to breed here, though it is probable that the Yellow-headed Blackbird does so in the vicinity, and that the Mergansers raised their young here this season.

ROBT. H. WOLCOTT, Lincoln.

NOTES ON SOME OF THE RARER BIRDS OF GAGE COUNTY

Japanese Ring-necked Pheasant (*Phasianus torquatus*). A male specimen of this beautiful bird was shot near Barneston, Nebraska, December 3, 1900. It was in thick brush when shot, the man having no idea of what he was shooting other than that it was a bird of some kind. It was brought here for mounting, and on skinning it, a small amount of what greatly resembled artichoke was found in its crop.

Townsend's Solitaire (*Myadestes townsendii*). On March 28, 1899, a specimen of this bird was shot near Beatrice. It was a female, and its stomach contained a few hard seeds.

Bohemian Waxwing (*Ampelis garrulus*). A large flock of this somewhat rare bird was seen January 9, 1899.

Arctic Towhee (*Pipilo maculatus arcticus*). I shot a lone specimen of this western bird near Beatrice, October 14, 1899. It was feeding on sunflower seeds.

Pine Siskin (*Spinus pinus*). Saw a pair of this species April 23, 1899.

Redpoll (*Acanthis linaria*). February 20, 1899, an immense flock numbering at least two or three hundred individuals was seen, they remaining the greater part of the day feeding on sunflower seeds.

Arkansas Flycatcher (*Tyrannus verticalis*). A pair of these birds was first observed May 5, 1900. Later several other pairs were found, one

pair remaining in a certain clump of trees near a small spring throughout the summer, evidently having a nest there.

Red-shafted Flicker (*Colaptes cafer collaris*). Very common in early spring and late fall, and common in winter, becoming rare, however, as a summer resident.

Red-bellied Woodpecker (*Melanerpes carolinus*). One shot April 21, 1900. Several pairs seen later in the summer, and I believe they breed here, one pair at least beginning a nest.

Saw-whet Owl (*Nyctala acadica*). Shot a specimen near Beatrice, December 7, 1900.

Golden Eagle (*Aquila chrysaetos*). A fine specimen shot a few miles west of Beatrice in October, 1899, by a party of gunners.

Black-crowned Night Heron (*Nycticorax nycticorax nævius*). May 1, 1900, a specimen of this heron was killed near Beatrice. Also a specimen of the Western Willet (*Symphemia semipalmata inornata*).

American Egret (*Ardea egretta*). I saw a fine specimen of this rare heron, July 12, 1900, on Cedar Creek, seven miles east of Beatrice.

MYRON H. SWENK, Beatrice.

ITEMS

Several Ruby-crowned Kinglets remained at West Point in May, 1900, till about the middle of the month. A cat was seen eating one on the 17th.—J. C. Crawford, Jr.

There are in my collection representatives of the three species of Scoters so far recorded for the state, all collected at Lincoln and on the following dates: American Scoter (*Oidemia americana*), female, September 28, 1895; Surf Scoter (*Oidemia perspicillata*), male, October 7, 1896; White-winged Scoter (*Oidemia deglandi*), October 14, 1899.—August Eiche.

A male Baltimore Oriole was shot in a tangled thicket at Emerald, seven miles from Lincoln, November 30, 1900. The bird was in perfect condition except that three or four feathers on the left side of the tail were only half grown.—M. A. Carriker, Jr.

PRICE, $1.00

PROCEEDINGS

OF THE

NEBRASKA ORNITHOLOGISTS' UNION

AT ITS

THIRD ANNUAL MEETING

Lincoln, Nebr., Feb. 1, 1902

Edited by

ROBERT H. WOLCOTT

Lincoln, Nebr.
STATE JOURNAL COMPANY, Printers
December, 1902

PLATE I

HEAD OF RED-SHOULDERED HAWK. (See page 40.)

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THIRD ANNUAL MEETING

NEBRASKA ORNITHOLOGISTS' UNION

OFFICERS

PRESIDENT.....Erwin H. Barbour, Lincoln
VICE-PRESIDENT.....Elizabeth Van Sant, Omaha
RECORDING SECRETARY.....R. H. Wolcott, Lincoln
CORRESPONDING SECRETARY.....J. C. Crawford, Jr., West Point
TREASURER.....Chas. Fordyce, University Place
EXECUTIVE COMMITTEE.....Chairman, L. Bruner, Lincoln
.....F. H. Shoemaker, Omaha
.....I. S. Trostler, Omaha

ABSTRACT OF MINUTES

The third annual meeting of the Nebraska Ornithologists' Union was called to order in the Hall of Mechanic Arts, the University of Nebraska, at 11:30 a. m., February 1, 1902, with President Barbour in the chair. Nineteen members were present.

The reading of the minutes of the preceding meeting, which had been previously published, was, on motion of J. M. Bates, dispensed with. The report of the Treasurer was referred to an auditing committee. Informal reports were made from both record and migration committees.

R. H. Wolcott moved that a permanent committee be appointed by the President to take the place of the record committee, to have in charge the matter of records and also the collecting of material for a list of birds of the state, to be published as soon as completed, under authority of the Union. An amendment was presented by I. S. Trostler making the committee consist of seven members, and another by J. M. Bates to the effect that the committee itself fill vacancies in its membership. Both amendments, together with the motion as amended, were carried.

A list of names of persons recommended for membership was read by

the Secretary and the candidates were, on motion of I. S. Trostler, declared elected.

The Corresponding Secretary reported the election of the following officers for the ensuing year, as a result of the recent ballot: President, J. M. Bates, Callaway; Vice-President, Mrs. George H. Payne, Omaha; Corresponding Secretary, J. C. Crawford, Jr., West Point; Recording Secretary, R. H. Wolcott, Lincoln; Treasurer, August Eiche, Lincoln; Executive Committee, H. B. Ward, Lincoln, H. M. Benedict, Omaha, and Merritt Cary, Neligh.

The Recording Secretary presented a brief report in behalf of the Executive Committee, and also reported on the publication of the Proceedings, in which task he acknowledged the assistance of several other members of the Union, and in which he recorded the gift to the Union, by the authors, of the plates used in illustrating the articles of Elizabeth Van Sant and F. H. Shoemaker.

The following committees were announced by the chair: Auditing committee, J. M. Bates, I. S. Trostler, M. A. Carriker, Jr.; committee on resolutions, H. B. Ward, August Eiche, J. C. Crawford, Jr.

At 12 m. the Union adjourned to meet again at 2:30 p. m., in Room 301, Hall of Mechanic Arts, and to listen to the program of papers, preceded by the delivery of the President's address, on "The Progenitors of Birds," illustrated by the stereopticon. About fifty members and others were in attendance.

After the completion of the program and discussions a short business session was held at which the auditing committee and the committee on resolutions reported and the President announced the appointment of the following permanent committee on the birds of the state: R. H. Wolcott, L. Bruner, I. S. Trostler, M. A. Carriker, Jr., M. H. Swenk, F. H. Shoemaker, J. A. Dickinson.

The minutes of the meeting were read and approved and the new President, J. M. Bates, formally presented to the Union, after which the society adjourned, at 5:30 p. m., to partake of a supper, and later, in the evening, to enjoy lantern slides exhibited by Lawrence Bruner M. A. Carriker, Jr., I. S. Trostler, and F. H. Shoemaker.

ROBERT H. WOLCOTT,
Recording Secretary

REPORT OF THE TREASURER TO FEBRUARY 1, 1902

RECEIPTS

Balance from previous Treasurer	$6 68
47 Annual dues—Active	47 00
24 Annual dues—Associate	12 00
Sale of Proceedings	25 43
Total	$91 11

EXPENDITURES.

Stenographic work	$1 50
Postage—Treasurer's office	1 40
Engraving—Second Proceedings	8 91
Postage and stenographic work—Secretary's office	8 27
Balance on hand	71 03
Total	$91 11

CHAS. FORDYCE,
Treasurer.

LIST OF MEMBERS

Corrected to December, 1902. Corrections and additions only.

HONORARY

Morton, Hon. J. Sterling. Deceased.

ACTIVE

CORRECTIONS:

Bates, Rev. J. M., A. M.....Red Cloud
Benedict, H. M., A. M., Instr., Dept. Zool., Univ. of Cin.....Cincinnati, O.
Caldwell, Miss Anna .....1726 Q St., Lincoln
Cary, Merritt, Asst. Biol. Surv., U. S. Dept. Agric.....Washington, D. C.
Condra, Geo. E., Ph. D., Instr., Dept. Geol., Univ. of Nebr.....Lincoln
Froley, J. A. Should read Frawley .....Stromsburg
Hunter, J. S., Asst. Dept. Ent., Univ. of Cal.....Berkeley, Cal.
Jacobs, Mrs. A. M. Deceased.
Lobingier, Mrs. C S.....514 No. 23d St., Omaha
Mullen, Roy F.....North Platte
Reid, Miss Mary A. Should be in list of associate members.
Scott, E. H. Should be indicated as a charter member.
Stringer, Miss Caroline, Asst., Dept. Zool., Univ. of Nebr.....Lincoln
Swenk, Myron H.....1821 O St., Lincoln
Tout, Wilson, Supt. Schools.....Dunbar
Trostler, I. S.....4246 Farnam St., Omaha

ADDITIONS: (Year of beginning membership at right.)

Arter, Jason .....Kirkwood 1903
Barkley, Mrs. W. E., Jr.....1306 L St., Lincoln 1902
Bates, Carlos .....Lincoln 1902
Black, Cyrus A. .....Kearney 1902
Cornell, U. G., Photographer, Univ. of Nebr.....Lincoln 1902
Crawford, B. E., Prof. of Zool., Union Coll.....College View 1902
Duncanson, H. B., Prof. of Zool., State Normal.....Peru 1901
Everett, H. H., M. D.....27 Burr Blk., Lincoln 1902
Forell, Rev. E. von, Regent, Univ. of Nebr.....Kearney 1902
La Forge, Leon .....1755 South St., Lincoln 1902
Lambertson, O. F., D. D. S.....Room 22, 1205 O St., Lincoln 1902
O'Mahony, P.....1126 O St., Lincoln 1902
Peters, R. C. .....1702 Farnam St., Omaha 1902
Russell, Donnell L. .....1642 So. 22d St., Lincoln 1902
Stephens, E. F.....Crete 1902

Thompson, Robt. ..... State Normal, Peru 1902
Towne, Solon R., M. D. ..... 22 Continental Blk., Omaha 1902
Van Sant, Adam C. ..... 716 New York Life Bldg., Omaha 1901

ASSOCIATE

CORRECTIONS:

Bassett,, S. C., State Food Commissioner ..... Lincoln
Bruner, Miss Amy, Prin. High School ..... Wisner
Dakin, Miss Sarah T. Resigned.

ADDITIONS:

Baird, Herbert ..... 1620 A St., Lincoln 1902
Barbour, Miss Carrie, Asst. Museum, Univ. of Nebr. ..... Lincoln 1902
Brown, C. E., D. D. S. ..... 1645 Maple St., Lincoln 1902
Bruner, H. F. ..... Swan P. O., Holt Co. 1901
Condra, Mrs. G. E. ..... Halter Blk., Lincoln 1902
Cowles, Ovando ..... N. Y. Life Bldg., Omaha 1902
Crum, C. W., County Supt. Schools ..... Madison 1902
Davenport, H. J., Ph. D., Instr., Univ. of Chicago ..... Chicago, Ill. 1901
Dunlap, N. C. ..... Kearney 1902
Groff, Miss Helen A. ..... 12th and P Sts., Lincoln 1902
Hartwell, F. E., U. S. Weather Service ..... 2913 P St., Lincoln 1901
Knapp, Miss Katherine ..... 402 Michigan St., Pueblo, Colo. 1901
Kofahl, Harry J. ..... Austin, Tex. 1902
Leavitt, Rev. F. W. ..... West Point 1902
Mackay, J. H., M. D. ..... Norfolk 1902
Miller, Mrs. Olive Thorne ..... Brooklyn, N. Y. 1902
Mockett, J. H., Sr. ..... Burr Blk., Lincoln 1902
Mockridge, Miss D. C. ..... Hastings 1902
Rich, Guy C., M. D. ..... Sioux City, Ia. 1902
Treat, Miss Annie ..... Weeping Water 1902
Woodard, John A., County Supt. Schools ..... Aurora 1902

SUMMARY

Honorary members	3
Active members	79
Associate members	57
Total	139

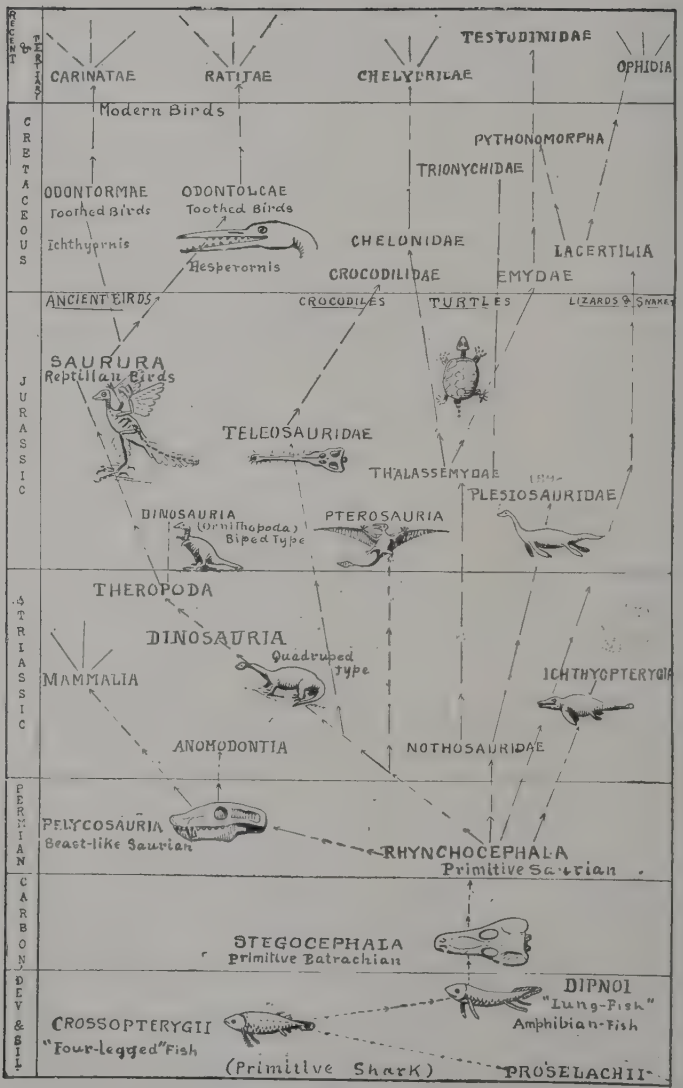


Fig. 1—Showing probable avian ancestry.

PAPERS

PRESIDENT'S ADDRESS—THE PROGENITORS OF BIRDS

ERWIN HINCKLEY BARBOUR, LINCOLN

It is difficult to cast into type a subject presented to this society extemporaneously and at length, and profusely illustrated by the projecting lantern. Still, it is possible to state the main facts in an abstract, and to reproduce the more important illustrations by zinc etchings.

The exact ancestry of birds, though not traced step by step, is fairly well determined now, and as palaeontological research advances is sure to be known in detail. It must be remembered that this lineage may be traced far back by the embryologist, who catches glimpses of earlier forms through the study of embryos, though the main work must be done by the palaeontologist, involving long-continued and exhaustive research.

The palaeontologist would have little to say about the time and the labor if the material were at hand. That is to say, bird remains are rare in the rocks. This fact is variously accounted for, but seems to be attributable largely to the power of flight. This means of rapid locomotion through the air has enabled birds to pass over barriers sufficient to check other animals, and to thus distribute themselves over the world. They are enabled to travel quickly from one point to another and it is probable that the bulk of dead birds fall upon or near to the land. If upon land they suffer complete decay. The hardest of their bones would last but a short time thus exposed, for under the changes wrought by sun, wind, rain, and all the atmospheric agents they would pass away into the air as gas and water, and a certain amount would return to the soil as an earthy residue. If upon the water, they meet with destructive worms, mollusks, fishes, and other animals and few escape. Still if dropped in water or in a boggy place and left in an undisturbed bed, the chances of preservation are good, inasmuch as bones under such favoring conditions undergo only partial decomposition, being excluded from contact with the free air. It is apparent then that but few fall in the favored spots. Still, as one considers the ages which have elapsed since the Jurassic, or even before, when ornithic flight began, it seems almost incredible that so few birds are to be found in the fossil state. At first impulse one might feel disposed to trace the avian lineage through the strange flying dragons known as pterodactyls. However, critical study makes this line of descent doubtful and tends to establish a close kinship to the dinosaurs, however unlike them birds may seem to be. To the layman the word "dinosaur" implies something necessarily huge, but

Four Jurassic Dinosaurs of the quadruped and biped types representing the group of reptiles through which birds probably ascended.

Fig. 2—*Brontosaurus excelsus* from the Jurassic of Wyoming ($\times \frac{1}{180}$).
Fig. 3—*Anchisaurus colurus* from the Triassic of Connecticut ($\times \frac{1}{24}$).
Fig. 4—*Ceratosaurus nasicornis* from the Jurassic of Colorado ($\times \frac{1}{60}$).
Fig. 5—*Iguanodon bernissartensis* from the Cretaceous of Belgium ($\times \frac{1}{80}$). The avian plan of pelvis in Fig. 5 is worthy of notice.

there were those as small as the domestic fowl. Unfortunately, as already stated, the number of specimens of birds from which laws may be deduced are few, and while the earliest birds bear the imprint of characters indicative of their approach to the Reptilia it is not decisively revealed as yet out of which group they were derived. Though differing widely in outward appearance from dinosaurs there are structural points of close similarity, and the one graduates so insensibly into the other that it cannot be settled offhand just when or where the reptile left off and the bird began. That is to say, there are connecting links or generalized forms which leave one in doubt as to whether certain specimens are avian reptiles or reptilian birds, as has been attested many times by scientists at home and abroad.

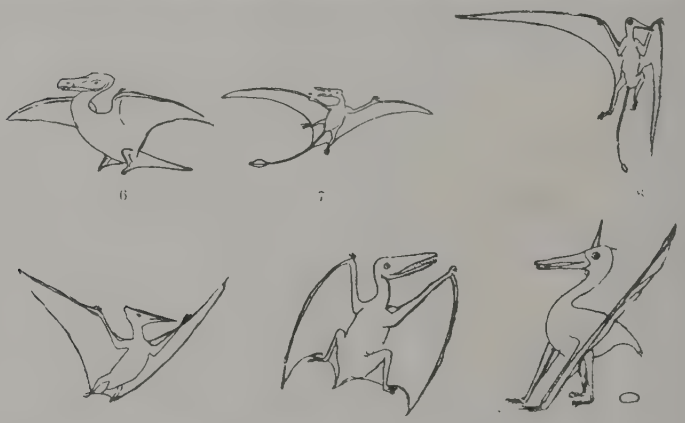
In attempting to systematize and classify these forms taxonomists find so many structural characters in common between reptiles and birds that they have united the two under one primary division called the Sauropsida (reptile-like) just as fishes and batrachians are classified under one general name Ichthyopsida (fish-like).

The names Ornithoscelida (bird-legged animals, or Dinosauria), Ornithosauria (or pterodactyls), and Ornithes (birds), all derived from the Greek word for bird, suggest close structural relationship. It can be asserted confidently that the bird branch of the Reptilia began to diverge from the true reptiles back in the Jurassic or possibly the Triassic. At any rate it is definitely certain that as early as the Jurassic birds were differentiated, for at that time animals existed bedecked in feathers, which since the days of Linnaeus has been accepted as the distinctive badge of birds. This differentiation took place before the form of the vertebrae had changed from the biconcave reptilian type to the saddle-shaped articulations found in birds; before the caudal vertebrae had become modified and changed from a functional to a shortened, inflexible, nearly functionless series; and before the pelvis had developed out of its separate elements into a solid piece. It was before birds had beaks, for though possessing an avian skull the mouth of the earliest birds was rather beast-like, an effect heightened by numerous teeth. This was before birds had evolved into the wholly toothless modern kind—that is, toothless as adults, but not wholly so as embryos. Certain embryonic birds furnished evidence of a toothed ancestry long before the actual facts were known.

SOME RELATIVES OF BIRDS

Of the relatives of birds we have on the one side the highly interesting and well specialized Pterosauria and on the other the ponderous Dinosauria, the former specialized for flight, the latter for locomotion. The pterodactyls, grouped together under the general title Pterosauria or Ornithosauria (bird-lizard) came near being birds, but are barred on the ground of possessing four digits in the hand, having the ischium and pubis at right angles instead of parallel, and being without

feathers. The wing membrane was very like that of the bat, which does not signify weak flight, the bat being particularly agile on the wing; though analogous to a bird's wing it is in no sense homologous. These animals preyed upon lizards, birds, and probably on the small mammals of the time. The other group of relatives is the Dinosauria or the Ornithoscelida (bird-legged animals). They are so closely related that the comparative osteologist fails to distinguish the separate bones of dinosaurs from those of birds. They were at least intermediate between reptiles and birds. Contemporaneous with the huge dinosaurs there existed in this country many diminutive ones, some of them of arboreal



Six outline restorations of Pterodactyls, close relatives of birds, thought by some to be the ancestors of birds. Modified, after Seeley.

Fig. 6—*Rhamphocephalus.* John Phillips, 1871.
Fig. 7—*Rhamphorhynchus.* O. C. Marsh, 1882.
Fig. 8—*Rhamphorhynchus.* V. Zittel, 1882.
Fig. 9—*Ornithostoma.* S. W. Williston, 1897.
Fig. 10—*Dimorphodon.* Buckland, 1836.
Fig. 11—*Ornithocheirus.* H. G. Seeley, 1865.

habits and scarcely to be distinguished from birds, the absence of feathers constituting, as geologists think, the essential difference, though this is a superficial rather than a fundamental distinction.

While it is not possible or profitable to compare each, part by part, nevertheless a series of skulls, skeletons, and restorations of the Ornithosauria, of the Orinthoscelida, and of birds, are submitted for comparison without description. In a like manner numerous examples of the pelvis of typical individuals are figured for comparison, and attention is directed to the similarity of the pelvis of the Ratitae, especially the Emeu and Dinornis, and that of the Saurischia (reptile-like pelvis)

such as the carnivorous Megalosaurus and Ceteosaurus, and that of the Ornithischia (bird-like pelvis) such as Iguanodon. Probably the first evidence of bird life in America dates back to the famous footprints of the Connecticut Valley, and yet, as is now known, these same tracks were made mostly, if not wholly, by dinosaurs. Some of them must surely have been very bird-like; their bones were light and hollow and their tridactyl tracks were so like those birds that there is justification for the book published by the commonwealth of Massachusetts entitled Ornithichnites (stony bird-tracks), a title subsequently changed to Ornithoidichnites (stony bird-like tracks), greatly to the credit of the authors, who thereby anticipated knowledge which is now the common property of every text-book of geology. The first bird-tracks of that

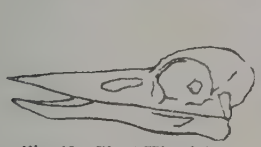


Fig. 12—Giant Kingfisher.

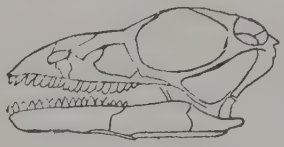


Fig. 13—Anchisaurus.

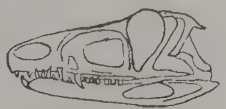


Fig. 14—Ornithosuchus.

Fig. 15—Ptenodracon.

Fig. 16—Scaphognathus.

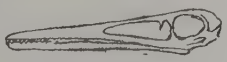


Fig. 17—Pterodactylus.

Fig. 18—Dimorphodon.

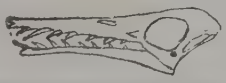


Fig. 19—Rhamphorhynchus.

Fig. 20—Ornithostoma.

Skulls of Bird (Fig. 12), Dinosaurs (Figs. 13 and 14), and six genera of Pterodactyls (Figs. 15 to 20) for comparison as to general structural plan.

region ploughed up by Pliny Moody, just a century ago, led to the discovery of thousands of others ranging in size from pigmies to giants. The commonest were about as large as those of an ostrich. According to popular conception they were all made by birds. Some ten thousand such tracks furnished no evidence to the contrary until one set was found which proved to be unique and instructive, inasmuch as the slab not only showed the tracks of a distinctly biped-like animal, but also showed the imprints of the five fingers of the hand which is distinctly un-bird-like. It must have been somewhat bird-like, perhaps resembling in general a domestic fowl divested of plumage; but the five functional fingers are irreconcilable with the idea of a bird whose fingers, as such, are functionless and are fused into a support for the wing feathers.

Fig. 21—Ceratosaurus.

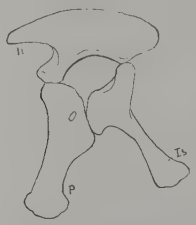


Fig. 22—Brontosaurus.

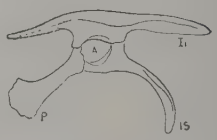


Fig. 23—Triceratops.

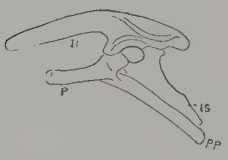


Fig. 24—Stegosaurus.

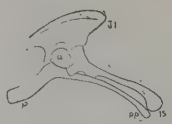


Fig. 25—Camptosaurus.

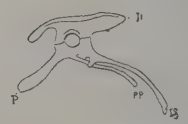


Fig. 26—Iguanodon.

Fig. 27—Dinornis.

Fig. 28—Emeu.

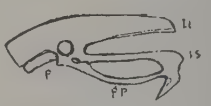


Fig. 29—Ostrich.

Fig 30—Hesperornis.

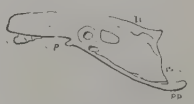


Fig. 31—Fowl.

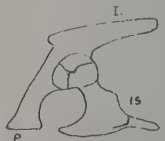


Fig. 32—Lizard.

Fig. 33—Alligator.

Fig. 34—Ornithostoma.

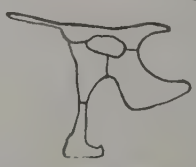


Fig. 35—Cycnorhamphus.

Pelvic bones of Reptiles and Birds showing close structural relationship. *Il*, ilium; *Is*, ischium; *P*, pubis; *Pp*, post pubis.

Dinosaurs (Figs. 21 to 26), birds (Figs. 27 to 31), lizard (Fig. 32), alligator (Fig. 33), pterosaurs (Figs. 34 to 35).

ARCHAEOPTERYX

However, the structure of the form just described seems less incongruous to those who are familiar with the Archaeopteryx from the limestone of the Solenhofen quarries of Bavaria, the present accepted starting point of avian history. The ancestors of this ancestor must be sought in the Triassic or possibly in the Permian. This ancient reptilian bird, figured in every geology, did not have a full set of free digits it is true, but it did have three free digits in the hand or wing, and in other respects is a pretty fair sort of connecting link between the reptiles of sandstone days and the birds of the present. Here one finds reptilian and avian characters blended in a manner so extraordinary as to furnish food for contemplation, and we may wonder if the "missing links" are really missing.

The Archaeopteryx, according to most palaeontologists, was distinctly a bird with the ear marks of its kind, but with many peculiarities inherited from its reptilian grandparents. According to others, it is a quadruped, not a bird; but its plumage is the most unerring evidence of its avian relationship. Yet divested of this its body would have resembled a lizard or a small biped dinosaurian reptile. There were quill feathers on the wings, legs and tail, and possibly a total absence of feathers on the body. Still, in this connection, it is not amiss to note a strikingly suggestive resemblance to the pterodactyl called Rhamphorhynchus. Each had long forearms and hands and three free claws. The feathers are like those of birds but are unique in that there are quill feathers on the legs and a pair of rudder feathers corresponding to each caudal vertebra. This avian lizard had advanced to the point where it had adopted feathers for scales and had an elongated lizard-like tail. Because of this last-named peculiarity Archaeopteryx has been classified with the Saururae (lizard-tailed forms). The head, though bird-like, was lizard-like in outward aspect at least, for there was no horny beak and the jaws were set with conical teeth. Its feet were tridactyl as were many of the dinosaurs. Its

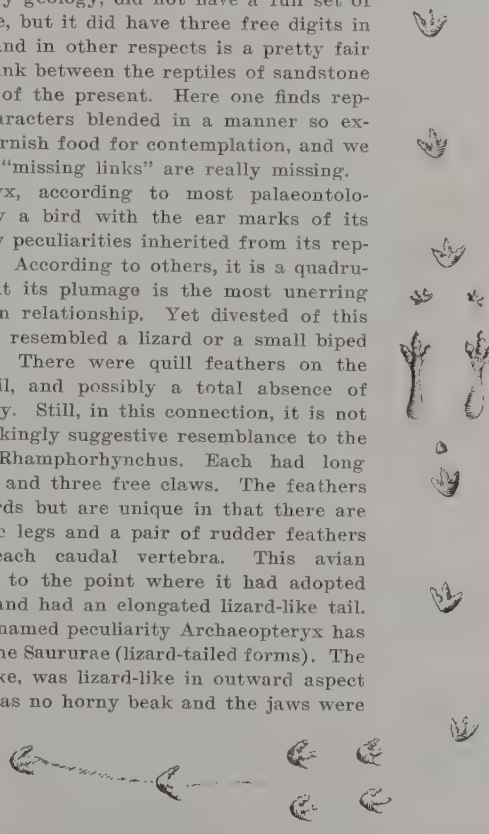


Fig. 36—"Bird" tracks in the Connecticut river sandstone (Triassic). Not until several thousand of its tracks had been found was it discovered that the "bird" had fingers and was a biped dinosaur. Observe the marks of the fingers left while fumbling for something in the mud. Observe also the heels such as birds do not have and the impression of the ischial bones in the portion, *a* to *b*, which is drawn from a slab in the museum of Yale University.

strong shoulder-girdle and broad ossified sternum, with keel for the attachment of the great flying muscles, are the properties of birds of flight, and so are they of reptiles of flight. The hollowness of its bones is paralleled by that of the more active reptiles. The vertebrae were biconcave or flat at the ends, as in many reptiles, and not heterocoelous or saddle-shaped, as in the case of birds, and those of the tail, numbering twenty in all, were lizard-like, not having been atrophied, as in modern birds. The pelvic bones are unconsolidated, which is a character of reptiles and of embryonic birds. The conviction must force itself upon every honest mind that we have here a mixture of characters,

Fig. 37—*Archaeopteryx macrura* (*lithographica*). H. von Meyer, after Owen. From the lithographic limestone of Solenhofen, Bavaria (upper Jurassic), preserved in the British Museum. ½ natural size. Showing skeleton with impression of wing and tail feathers.

which is only another way of saying it is a connecting link in the evolution of its kind. This mixture of characters is the more apparent when one groups and contrasts those characters which are reptilian and those which are avian. The following are reptilian inheritances: upper jaw and mandible set with teeth in sockets (thecodont or socket-tooth dentition); the centra of the vertebrae with flat articulations; numerous caudals, each with a pair of rudder-feathers; ribs slender and probably lacking uncinate processes; cervical ribs moveably articulated throughout life; abdominal ribs like those of crocodiles; digit III with four phalanges and with a claw which is strongly reptilian.

Fig. 38—*Archaeopteryx macrura* (*lithographica*). H. von Meyer. Skeleton from the Solenhofen slates of Bavaria (upper Jurassic). Showing the impression of feathers on wing, tail, and tibia—$\frac{2}{3}$ natural size. *cl*, clavicle; *co*, coracoid; *c*, carpus; *h*, humerus; *r*, radius; *u*, ulna. Compare Figs. 37, and 39 to 44.

Fig. 39—The Lizard-bird, *Archaeopteryx macrura*. Restored by Owen.

Fig. 40—The Lizard-bird, *Archaeopteryx macrura*, restored by Shufeldt. Pronounced reptilian appearance.

Fig. 41—*Archaeopteryx macrura*, restored by Pycraft, $\frac{1}{8}$ natural size. The tail appears pointed because foreshortened in the drawing.

Fig. 42—A reconstruction of *Archaeopteryx* from Koken, "Die Vorwelt."

Fig. 43—Restoration of *Archaeopteryx* from "Darwin and after Darwin."

Fig. 44—Restoration of *Archaeopteryx macrura* by Andreae, giving due proportion to reptilian and avian characters, showing feathers on wings, tail, and leg. Possibly the body was destitute of feathers.

The avian characters are as follows: wrist bird-like; foot avian throughout and adapted to biped locomotion; pelvis considered avian; bones hollow and pneumatic; feathered at least in part, as already described, a character which is decidedly avian; tarso-metatarsus covered with scales like modern birds. At the best it was a much more primitive affair than its later descendents. Its adaptations were for arboreal life, but as some think not for long sustained flight; nevertheless it enabled Jurassic times to boast of full-fledged birds. Doubtless at a still earlier period there were generalized progenitors clad also with feathers, or perhaps feather-like scales, yet neither distinctly reptiles nor distinctly birds.

Research will doubtless reveal these ancestors; meanwhile *Archaeopteryx macrura* (the primordial winged creature with the long tail),

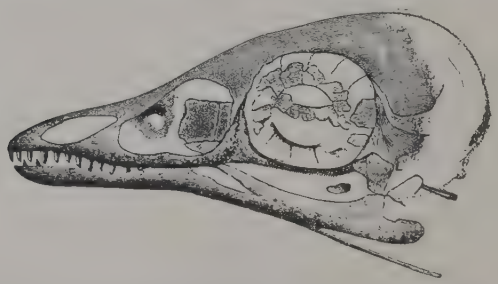


Fig. 45—Skull of the Lizard-bird, *Archaeopteryx macrura*, showing likeness to that of a typical bird but lacking a horny beak and with jaws set with conical teeth. Remnants of sclerotic plates are seen in the eye orbit. In life the appearance of the head was probably lizard-like rather than bird-like.

found in the upper Jurassic, stands as the oldest known bird. Its advent marks the greatest advance of Jurassic time. The first specimen found in the lithographic quarries of Solenhofen, dating back to 1861, was represented by a single feather, or rather its imprint, to which the name *Archaeopteryx lithographica* was applied, and it is a question if this should not be the specific designation instead of *A. macrura*, which name is still applied by some palaeontologists. Within a few months remains of the bird itself were found, and are now preserved in the British Museum. This is the specimen ordinarily known as *Archaeopteryx macrura*.

In 1877 another and still better one was found, which is now preserved in the Royal Museum of Natural History in Berlin. Though scarcely as large as a crow Archaeopteryx enjoys the distinction of great scientific weight. It might have been discovered at the outset that this ancient bird had teeth, but not suspecting anything of the sort it occurred to no one to look for them, and those who scrutinized

the detached jaw mistook it for that of a fish. So it came about that the discovery of birds with teeth fell to Yale University in 1873, when teeth were discovered by Marsh in *Hesperornis regalis*, from the chalk in the upper Cretaceous of Kansas.

HESPERORNIS

This was a genuine and brilliant discovery, and those interested may find a full account of it in Professor Marsh's monograph entitled Odontornithes. It is the irony of fate itself that this peculiarly important discovery was made about the time Owen and others were being criticised by the English clergy and press for the statement that embryology showed germ teeth in certain living birds and that modern birds had descended through a long line of toothed reptilian ancestors, and the discovery effectually closed the debate on the subject.

The writer hopes that it may be germane to the subject to mention parenthetically that as a student, and subsequently as an assistant, he repeatedly saw parties of men and women, far more religiously zealous

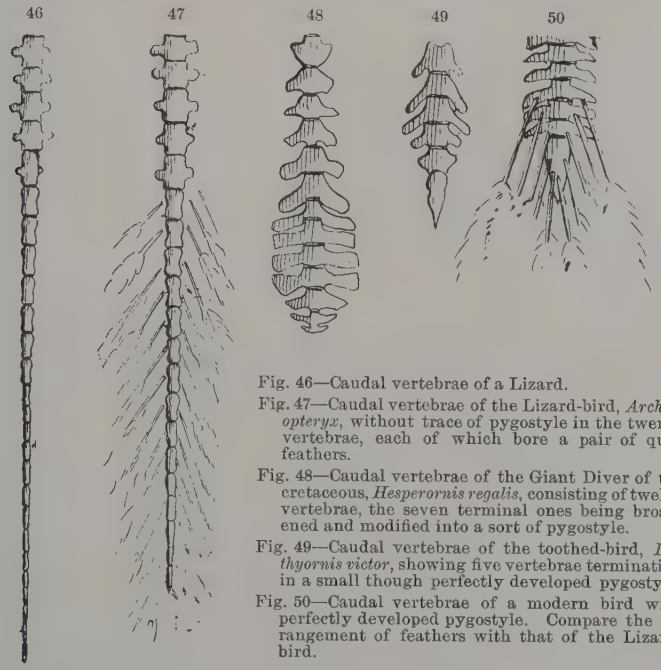


Fig. 46—Caudal vertebrae of a Lizard.

Fig. 47—Caudal vertebrae of the Lizard-bird, *Archaeopteryx*, without trace of pygostyle in the twenty vertebrae, each of which bore a pair of quill feathers.

Fig. 48—Caudal vertebrae of the Giant Diver of the cretaceous, *Hesperornis regalis*, consisting of twelve vertebrae, the seven terminal ones being broadened and modified into a sort of pygostyle.

Fig. 49—Caudal vertebrae of the toothed-bird, *Ichthyornis victor*, showing five vertebrae terminating in a small though perfectly developed pygostyle.

Fig. 50—Caudal vertebrae of a modern bird with perfectly developed pygostyle. Compare the arrangement of feathers with that of the Lizard-bird.

TAILS OF LIZARD, LIZARD-BIRD, AND TRUE BIRDS FOR COMPARISON

than wise, urging Professor Marsh to consider the advisability of concealing this specimen because it savored too much of evolution. They admitted its genuineness, seeing it was before their eyes in the cabinet, but denied that the facts should be made known by allowing it to stand so publicly on exhibition in the cases, and proposed as a remedy that an opaque curtain be so arranged as to be drawn over the specimen to conceal it. The case containing the polydactyl horses, as well as that containing Hesperornis and Ichthyornis, seemed to trouble them especially. Here were men and women afraid of the truth, and we see a repetition of that marvelously execrable fact that secular truths are not sacred while religious truths are.

Fig. 51

Fig. 52—Archaeopteryx

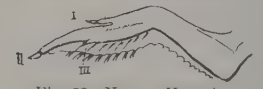


Fig. 53—Young Hoatzin

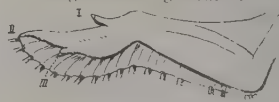


Fig. 54—Adult Hoatzin

Fig. 55—Young fowl

ANCIENT AND MODERN WINGS

Fig. 51—A young Hoatzin, a bird of South America, using its fingers and toes in climbing as ancestral birds probably did. Later the thumb and finger become shortened. See Figs. 53 and 54.

Fig. 52—A restoration of the hand-wing of *Archaeopteryx*, the Lizard-bird, showing three free digits and two fused digits for support of wing.

Fig. 53—Ventral view of the right wing of a young Hoatzin, *Opisthocomus cristatus*, showing relatively long free thumb and index finger used in climbing. To facilitate this end the three outer digital primaries remain undeveloped for some time. Observe that the hand is longer than the forearm in the young, and that thumb and index fingers have claws.

Fig. 54—Ventral view of the right wing of an adult Hoatzin for comparison with the manus of the young Hoatzin. The hand, or wing, is now shorter than the forearm; the thumb is considerably reduced; and the claw of the thumb persists as a small callus, while that of the index finger is suppressed.

Fig. 55—Ventral view of right wing of a young fowl (*Gallus bankiva*) an ally of Hoatzin. Having exchanged arboreal for terrestrial habits the hand or wing is shortened; the thumb alone retains a claw; the index finger does not project beyond the wing membrane; and the development of the three distal digital quills is arrested.

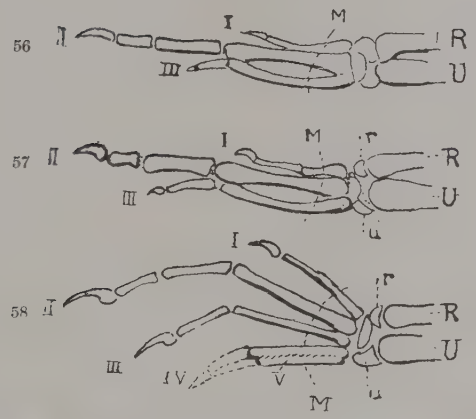


Fig. 56—Wing bones of a young Ostrich, with three free clawed digits showing the component parts of a bird's manus, and illustrating the similarity between the manus of *Archaeopteryx*, as seen on the Berlin slab, with that of existing birds.
Fig. 57—Wing bones of *Archaeopteryx* with three free digits as ordinarily shown.
Fig. 58—Wing bones of *Archaeopteryx* showing three free digits and two fused digits for the support of the quills. The identity of the fused metacarpals IV and V being apparently established, leaves this as much more likely than Fig. 57, the more so since digit III was too weak for the support of the wing feathers.
I, thumb; II to V, fingers; *M*, metacarpal, or hand bones; *R*, radius; *r*, radiale; *U*, ulna; *u*, ulnare.

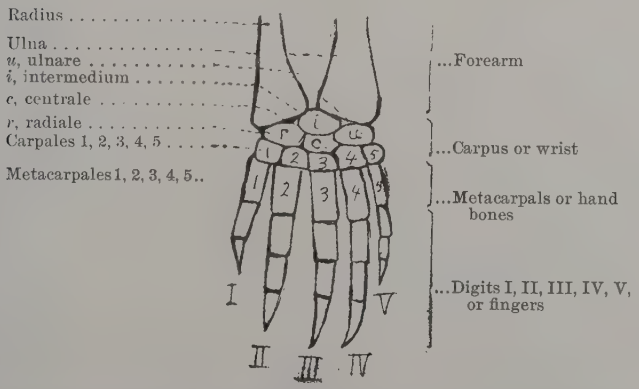


Fig. 59—A generalized hand, such as may be found in tortoises and salamanders; for comparison with the more specialized hands shown in succeeding figures, this being the structural plan of all, however divergent in appearance.

Fig. 72—Fish

Fig. 71—Whale

Fig. 70—Mole

Fig. 69—Turtle

Fig. 68—Pterodactyl

Fig. 67—Archaeopteryx

Fig. 66—Bird

Fig. 65—Bat

Fig. 64—Horse

Fig. 63—Sheep

Fig. 62—Hog

Fig. 61—Dog

Fig. 60—Man

Figures showing similiarity of structural plan in the arm and hand of widely divergent forms, like parts being connected by dotted lines. 1, the scapula in each case; 2, the humerus; 3, elbow joint; 4, the forearm, or radius and ulna; 5, the carpus, or wrist; 6, the hand; 7, the finger bones or phalanges. Attention is called to the four types of wings illustrated by the Bat, Bird, Lizard-bird (Archaeopteryx), and Flying Dragon (Pterodactyl).

Attention is also directed to hands modified for special purposes, such as the hand of man for grasping, the horse for running, bat and bird for flying, mole for burrowing, and whale for swimming.

The chalks of Kansas have yielded several of this species, the best specimens being at Yale, and in Professor Williston's collection at the University of Kansas. It is scarcely necessary to describe to ornithologists a fossil bird so well known as the Hesperornis. This giant diver stood five to six feet high, wingless, but empowered by adaptation and by special modification for feats in diving and swimming. Lucas calls attention to the fact that its feet acted sideways instead of forward and back under the body after the manner of swimming-birds.

Its jaws were set with numerous small, conical teeth, which were but mosasaur teeth in miniature, arranged in continuous grooves. In the upper jaw the teeth were confined to the maxillae, the pre-maxillae being edentulous. Both mandible and jaw were covered with a horny beak, unlike its Jurassic predecessor, the Archaeopteryx. In general appearance it resembled the loon or great northern diver save it was destitute of wings. It was a magnificent diver and swimmer and the largest of its kind. Long use had developed its feet while continued disuse had reduced its wings to rudiments consisting of one vestigial bone. Though plainly descended from birds originally empowered with flight, the dwarfed humerus is all that is left in proof. Yet, on the distal extremity, are facets for articulation with the radius and ulna, which evidence their former existence and the existence of the whole wing organ, it being presumed that the flightless birds are derived from those with wings. The bones of Hesperornis are remarkably hollow, unlike some swimming-birds whose bones incline to be solid, for the reason that nearly half of their weight is sustained by water. Its body was covered with feathers like those of Apteryx, as shown by Professor Williston, who has found specimens exhibiting the impression of skin and feathers.

The caudal vertebrae show that the tail of Hesperornis differed from that of modern birds. It was not so long and reptile-like as that of Archaeopteryx but more so than that of modern birds. So in the interesting drawing by Gleason, made under the direction of Lucas, in his book entitled Animals of the Past, there is shown a sort of intermediate stage between Archaeopteryx and modern forms, as will appear in the accompanying cut.

Here again we have a blending of the reptilian and avian characters with a preponderance of the latter. In habit it was carnivorous as evidenced by its teeth, and fish doubtless constituted its diet. The other known Cretaceous birds differ little from modern ones. Between Cretaceous and Eocene times they had lost their teeth and certain other ancestral peculiarities to such an extent that the birds of Tertiary time are like those of the present day. The ornithologist must now reckon with a toothed as well as a toothless division in both orders, Ratitae and Carinatae. In the Ratitae, to which Hesperornis belongs, we find all the remaining representatives of the order toothless, and

we are introduced to a set of birds which might constitute a taxonomic division known popularly as "giants," among which are the giant birds of Madagascar and the giant bird of New Zealand. There is something very impressive in the mere matter of size. These feathered giants have been so recently exterminated that they are handed down in tradition and fall within historic times, and may be considered sub-fossil.

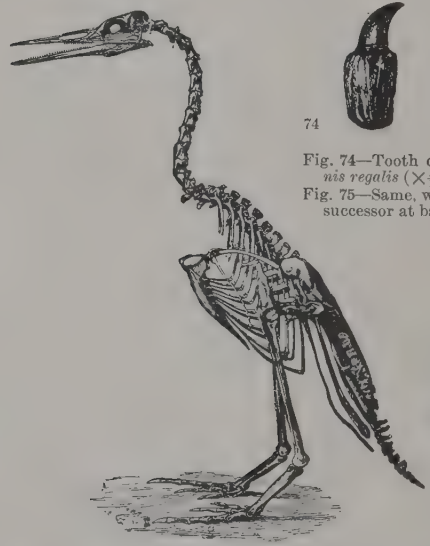


Fig. 73—Skeleton of *Hesperornis regalis*. Restored by Marsh ($\times \frac{1}{12}$).

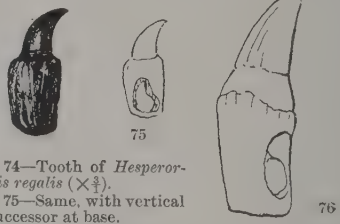


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Fig. 74—Tooth of *Hesperornis regalis* ($\times \frac{3}{1}$).
Fig. 75—Same, with vertical successor at base.
Fig. 76—Tooth of Cretaceous Mosasaur, with vertical successor at base. About one-fourth natural size for comparison with Fig. 75.

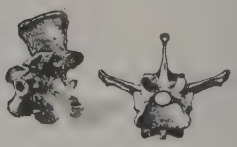

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Fig. 77—Twentieth dorsal vertebra. Side view ($\times \frac{1}{4}$).
Fig. 78—Same from in front, showing saddle-shaped articular faces.

Fig. 79—Side view of left lower jaw of *Hesperornis regalis*. Length 10 inches.

Fig. 80—Same, top view. Showing groove for teeth.

AEPYORNIS

In the Pleistocene of Madagascar occur the bones of a giant bird, *Aepyornis*, of the family Aepyornithidae, which lives in tradition. These were great ostrich-like birds almost or quite as large as their distinguished relatives, the great moas of New Zealand. Three or four species

Fig. 81—Giant toothed diver, *Hesperornis regalis*, from the Cretaceous of Kansas. Restored by Hutchinson. Height 5 to 6 feet.

Fig. 82—*Hesperornis regalis*, restored by Shufeldt.

Fig. 83—Restoration of Hesperornis by Lucas. Observe position of feet which are supposed to have worked sideways instead of forward and back under the body in the usual way.

of the genus are known, headed, in point of size, by *Aepyornis maximus*, which stood nine to ten feet high and equaled the weight of the moa bird Dinornis, which stood eleven to twelve feet high. The egg of this bird is the largest known, being thirteen inches long and nine to ten inches in width with a capacity of over eight quarts, and is the especial admiration of zoologists. (See Fig. 84.) For the sake of comparison it has been estimated that the cubic content is equivalent to that of six ostrich's eggs, or one hundred and fifty hen's eggs, or thirty thou-

sand humming-bird's eggs. Fragments of these eggs and occasional whole ones are found in swampy places, or floating on the water after storms, or in the graves of natives. *Aepyornis* is characterized by a short beak, the presence of a great toe and a small wing, and by other less obvious structural differences.

APTERYGES

Of the Apteryges several are reported, the largest, which is very like the living Apteryx, being Megalapteryx. These were confined to New Zealand, occurring in Pleistocene and in recent deposits; like the living kiwis or Apteryx, their bills were long and slender, adapting them for use in probing marshy ground for food. Apteryx is an exemplification of the statement that some fossils are living, for, though approaching extermination, it still lingers.

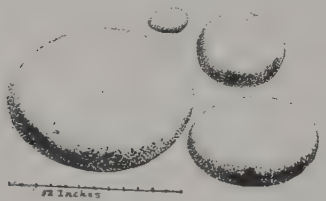

Fig. 84—Eggs of giant birds (Aepyornis at left, Moa at right) compared with a 12 inch rule, and with the egg of ostrich and hen (smallest) above.

MOA BIRDS.

In the Immanes (Dinornithes) is realized the largest of all birds, and Dinornis—the terrible bird—is a fitting appellation. The use of the Greek adjective *dinos* is frequent in geologic time, for each age has boasted of some huge creature to which *dinos*, or terrible, was applied, such as *Dinichthys*, the terrible fish, *Dinosaur*, the terrible saurian, *Dinornis*, the terrible bird, and *Dinotherium*, the terrible beast. The extermination of Dinornis is also within historic times; so recent in fact that nearly complete mummified specimens occur in which the skeleton is covered with dried skin with the feathers attached, and the eggs are said to still retain the original pale green color. The eggs are found in swamps, and are so large that it has been said that a hat would make an egg cup for them. Egg shells are also abundant in the refuse heaps of the natives. They do not date back of the Pleistocene although there is a hint of their occurrence in the Pliocene. Of the Dinornithidae, or moas, there is a long and confused list, *Dinornis* being the typical and best known as well as the largest form. It is characterized in outward appearance by a small beak, rudimentary wings, and the absence of the great toe. The fifteen or twenty species of described moas are confined to New Zealand, and include those varying from the size of a turkey up to the largest of all, *Dinornis maximus*, which stood ten to twelve feet high, and in size dwarfed the largest ostrich. In its geological history New Zealand, which is now divided by Cooks Strait into North and South Island, was originally one, but, perhaps by changes in level, the two have been separated and sufficient time has elapsed to account for a wide divergence of species. These

giants were wingless, so their means of defense, like that of the ostrich, consisted in speed and in the defensive blows dealt in kicking. Their leg bones were so powerful that they exceeded those of the horse and ox in size and it may be that such development was not only defensive but also enabled them to dig roots for food. Their bones occur literally in heaps in swampy places. A bird's safety is in flight, but these wingless or flightless birds found their safety in the absence of natural enemies; man being their arch-enemy. New Zealand and Madagascar

Fig. 85—*Dinornis maximus* (*giganteus*). Skeleton and restoration, compared with the skeleton of man.

are quite remote from the main land and the intervening water was a barrier to the carnivorous beasts of the continent and for a time to the tribes. So with ample food supply, a favorable climate, and absence of enemies, there was no check to their increase, and it is said no limit to the size to which they might attain.

MEGISTANES

The emeus and cassowaries have fossil representatives, the emeus at least occurring in the Pleistocene of Australia. Of the Rhaeornithes it is sufficient to mention the occurrence of their fossil remains in

the Pleistocene cave deposits of Brazil. Of the Struthiones, or ostriches, remains occur in the lower Pliocene of the Siwalik Hills of India and in the lower Pliocene of the island of Samos in the Turkish archipelago.

STEREORNITHES—PHORORHACOS

The next group, Stereornithes, is of such doubtful relationship that one feels disposed to admit it to the Ratitae chiefly on the ground of size. But its structure seemingly militates against this assign-

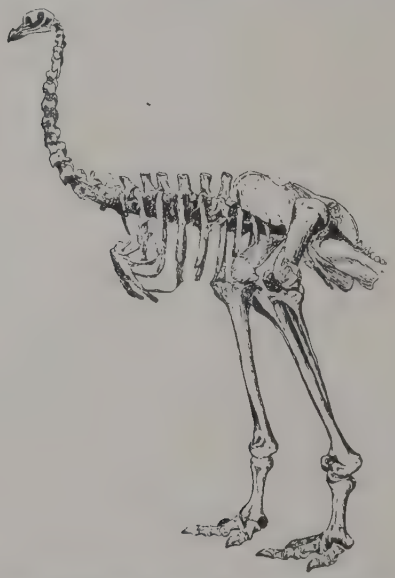

Fig. 86—*Dinornis* (*Palapteryx*) *elephantopus* Owen. With powerful legs and feet. Pleistocene of New Zealand.

Fig. 87—Leg of the giant Moa bird, *Dinornis maximus* (*giganteus*), compared with that of the full-sized horse.

ment, for it is settled that some of its members give positive evidence of having keeled sterna while others furnish negative evidence. Though recognizing that the group is carinate rather than ratite the best taxonomists place them provisionally with the Ratitae, though acknowledging their probable relationship to the cranes. Until further discoveries make final decision possible it is convenient to follow authority; at any rate this arrangement, which has much to warrant it, admits of grouping all the giant birds together. In this connection must be mentioned Phororhacos, which is destined to become a landmark in the

palaeontological history of birds. It is variously classed, with the cranes by some, with the herons by others, and in a class of its own by still others. Though of such a doubtful position the Phororhacos, a giant from the Miocene of Patagonia, much as it resembles an aberrant eagle in certain outward respects, is not such. The monstrous head, larger than that of a horse, and its curved eagle-like beak suggest a cruel carnivorous nature whether it fed on fish or flesh. But it has been proposed in extenuation that the ferocious beak was designed for digging roots, being aided by its powerful feet, or that its owner was a carrion-eater. At the best it was a formidable bird standing seven to eight feet high. No one can view its skull, casts of which are to be seen in museums, without astonishment. Large though its leg bones are they are wholly disproportionate to a skull of such unusual size. These Patagonian giants were made known to science by Ameghino in the year 1895, and have been subsequently described by Andrews in the Ibis for January, 1896, pp. 1-12, and Lucas describes and figures them in the Animals of the Past.

GASTORNIS

Of the Gastornithes, the best known is Gastornis, a bird as large as the ostrich, found in the lower Eocene of Europe, and compared with the geese. The skull was fifteen inches long with the margin of the jaws serrated somewhat as in Odontopteryx (Fig. 91).

TOOTHED CARINATAE

Leaving the flightless birds for that division empowered with flight we find the Carinatae, like the Ratitae, divided into a toothed and toothless representative of the order.

The Carinatae, now the most numerous group of birds, are characterized by many osteological peculiarities. For the average ornithologist it is sufficient to say that their fundamental characteristics are the broad sternum with its strong keel, and their power of flight. The amateur ornithologist must be reminded that this gift of flight is not universal among the Carinatae, for while the majority have wings adapted for flight, others from their mode of life have wings more or less atrophied, while in still others, such as the penguins, they are modified into paddles for swimming. The oldest known carinate bird is Laopteryx, from the upper Jurassic of this country; but since palaeontologists themselves confess their doubts as to this being a true bird and think it a bird-like reptile instead, and inasmuch as several other described birds prove to be ornithosaurs (pterodactyls), Ichthyornis and Apatornis, the toothed birds from the chalk beds of the Kansas Cretaceous enjoy the distinction of seniority among the carinates.

Ichthyornis was small, perhaps the size of an ordinary gull, but was nevertheless rendered conspicuous by an array of conical teeth, of which there are twenty in the maxillae, as many in the mandible,

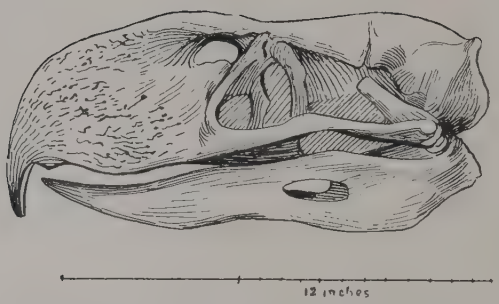

Fig. 88—Skull and mandible of *Phororhacos longissimus*. Found in the Miocene of Patagonia. Length of skull 23 inches. Compare with a horse's skull, represented by the line which is about 22 inches ($\times\frac{1}{6}$).

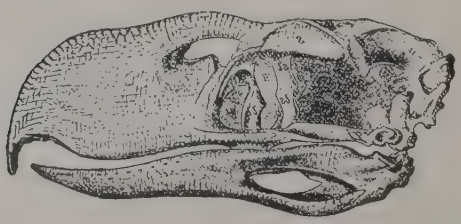

Fig. 89—Skull and mandible of *Phororhacos inflatus* Ameghino, from the Santa Cruz beds (Miocene) of Patagonia. Length of skull 13½ inches.

Fig. 90—Restoration of the giant Patagonian bird Phororhacos which stood 7 to 8 feet high. Miocene.

Fig. 91—Skeleton of *Gastornis edwardsii*. (After Meunier).

and none in the pre-maxillae. It is interesting to note that these teeth, which, like those of Hesperornis, may be likened to mosasaur teeth in miniature, have vertical successors, and the old teeth are gradually absorbed and displaced by the new. The teeth are set in distinct sockets, and in allusion to this the Greek name Odontormae has been applied to this sub-order. In most birds the dentaries of the two rami of the mandible are united at the symphysis, but in Ichthyornis as well as in Archaeopteryx and Hesperornis, the three birds which show the widest divergence known to any age of birds, the rami are loosely connected, which is a reptilian character. They are supposed to have lacked horny beaks. The vertebrae are amphicoelous or biconcave, an extraordinarily primitive character, and the caudals, which terminate in a pygostyle, should be compared with the earlier toothed birds. In Archaeopteryx the lizard-like tail, consiting of twenty caudals, was without a pygostyle (Fig. 47). In Hesperornis the caudals number twelve, six of which are united by their centra into an imperfect pygostyle (Fig. 48). In Ichthyornis there are five free caudals, and a small, though perfect, pygostyle. In modern birds the caudals are even more compressed and the pygostyle still more expanded. The size of the brain in both Hesperornis and Ichthyornis is inferior to the nearest allies of their respective sizes. All the other carinates are toothless, although a few still retain ancestral traits to the extent of exhibiting germ teeth while young. This is not anomalous for there are many animals which, having descended from toothed ancestors, exhibit the same peculiarities, and the teeth which they possess in the embryonic condition are absorbed in the adult.

TOOTHLESS CARINATAE

Though the number of toothless carinates described by the palaeontologist is seemingly large, the records are unfortunately meagre, otherwise the exact relation and classification of certain groups would be less doubtful. In this toothless division the very first bird to engage our attention is a "toothed bird" belonging to the Steganopodes. But we must distinguish between true teeth and teeth-like serrations.

Among the Steganopodes there is nothing particularly large or unique until we come to ODONTOPTERYX, which by some writers is put in a separate sub-order, Odontopteryges. Odontopteryx, of the Eocene in England, thought by some palaeontologists to be related to the ducks and geese, is so unique in the bony denticulation of its jaws as to constitute another landmark in avian palaeontology. Though apparently a toothed bird it is not such in fact, for the teeth are but sharp bony serrations of the jaw itself. As the figure will show there are two sizes of denticles or serrations, the more prominent alternating with the less prominent. This denticulation, a peculiarity of this group and unknown since Eocene time, is indicative of fish-eating habits. Some naturalists place Ichthyornis, Apatornis and Odontopteryx

under a special order, the Ichthyornithoformes, which seems an interesting though faulty arrangement (Fig. 97).

Albatrosses, cormorants, pelicans, etc., are represented from the Eocene up. Fossil flamingos are reported from a number of localities, occurring as early as the Eocene times but mostly from the Miocene to recent times. The waders known as herons, storks, ibises, spoonbills, etc., are well represented by fossil remains found chiefly above the lower Miocene. A giant adjutant-stork is known from Pliocene deposits.

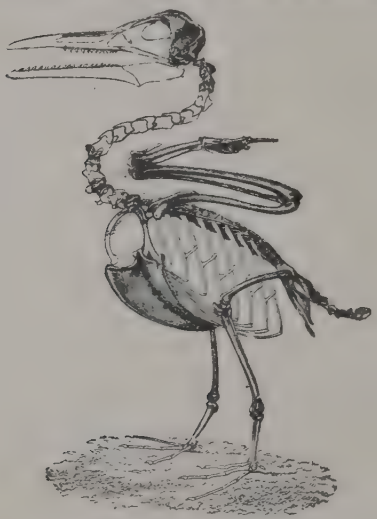

Fig. 92—*Ichthyornis victor* Marsh, a toothed bird from the Cretaceous of Kansas ($\times \frac{1}{4}$)

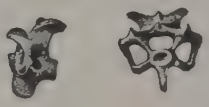

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Fig. 93—Cervical vertebra of *Ichthyornis dispar*.
Fig. 94—Same, front view showing biconcave centrum.

Fig. 95—*Ichthyornis dispar*. Left lower jaw, side view. Natural size 2¼ inches.

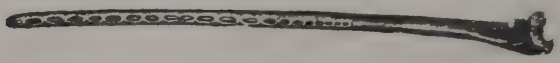


Fig. 96—Same, showing sockets for teeth.

where occur also the bones of several other giant storks. Not that the giants are fundamentally more important because of their size, but because they arrest attention first. But when size and structural peculiarities combine the palaeontologist is ecstatic. Of the ducks, geese, swans, and mergansers, there is a long list of fossil forms, occurring mostly since the upper Miocene, and so closely resembling existing

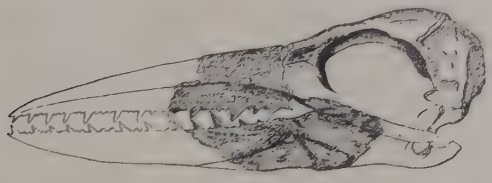


Fig. 97—Skull of *Odontopteryx toliapicus* Owen (restored); from the London clay (Eocene). The alveolar margins of the jaws show denticulation which must not be confounded with true dentition.

types as to be identified mainly with them. Plovers, gulls, and auks are represented among fossils.

The GREAT AUK (*Alca impennis*) has been so recently exterminated – the last two having been taken in Iceland in the year 1844, – that its bones, though common in certain superficial deposits of Iceland, Greenland, Labrador, Maine, and Massachusetts, are scarcely fossil, as the word is ordinarily understood.

The next landmark is found among the Columbae, or pigeons. The

Fig. 98—*Pelecanus intermedius*. Fraas, Haunenberg (Miocene). Beak and skull, and base of occiput at right.

DODO (*Didus ineptus*), of the island of Mauritius, and the SOLITAIRE (*Pezophaps solitarius*), of Rodriguez Island, in the Indian Ocean, are familiar to every one, being figured so frequently in geologies and natural histories. The accompanying illustrations give good ideas of the Dodo, which used to be exhibited in England and the continent. No living dodo has been known since 1681. Though clumsy and heavy, weighing about fifty pounds, and flightless, as the rudimentary wings show, and though unlike pigeons in outward appearance, it is nevertheless counted a ground-pigeon. The taller, though closely allied, Solitaire, also a ground-pigeon, whose last appearance is recorded in 1693, was also disqualified for flight, having rudimentary wings. The two

Fig. 99—*Anas blanchardi* M. Edw. (Miocene). St. Geraud-le-puy. Restored by Milne Edwards. About ¼ natural size.

Fig. 100—*Alca impennis*, the Great Auk. Recently exterminated. Bones now found in the superficial deposits of Europe and America.

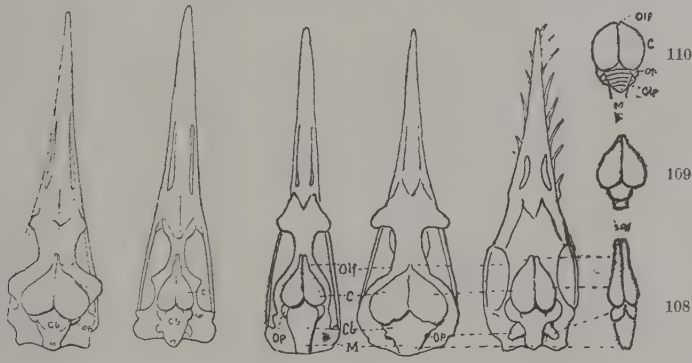
Fig. 101—Skeleton of the great ground pigeon, *Didus ineptus*, of Mauritius island. Exterminated about 1861.

Fig. 102—Dodo. Pen sketch from an early Dutch painting.

extinct ground-pigeons, Solitaire and Dodo, are known by nearly complete skeletons.

This is probably the last of that group of birds which belong to the class called "startling," the others belonging to the class "ordinary," attracting less attention and, as a matter of fact, furnishing fewer important lessons, thus justifying the palaeontologist's pride in the extraordinary forms.

For the sake of brevity we may bunch together a somewhat heterogeneous assemblage of terns, curlews, snipes, woodcocks, coots, etc.,



103 104 105 106 107

Crania and brains of ancient birds and reptiles for comparison with recent forms, all reduced to the same size.

Fig. 103—Loon (*Colymbus*) for comparison with Fig. 104.
Fig. 104—*Hesperornis regalis.*
Fig. 105—Ichthyornis.
Fig. 106—Tern for comparison with Fig. 105.
Fig. 107—Pterodactyl.
Fig. 108—Brain of Lizard.
Fig. 109—Brain of Duckbill (*Platypus*), a mammal of low order.
Fig. 110—Brain of owl.

C, cerebrum; *Cb*, cerebellum; *M*, medulla; *Olf*, olfactory lobes; *Op*, optic lobes.

Attention is directed to the evidences of cerebral evolution shown in the expanding cerebrum and cerebellum and the subordination of the olfactory lobes and optic lobes as seen in the modern forms.

and report them as represented by fossil remains in Tertiary beds. Hawks, parrots, owls, woodpeckers, etc., are all represented. The Passeriformes—crows, larks, sparrows, warblers, etc.,—are represented by such enormous numbers of living members, some eleven thousand in all, as to make the list of known fossil forms seem especially meagre. As an apology for this lack of knowledge it should in all justice be explained that the bones of such small birds are often obscure guides to exact taxonomic arrangement. And it is all the worse when the bones are fragmental, as is apt to be the case with such delicate

fossil remains. About all the palaeontologist can do in such cases is to arrange birds by families. However, the occurrence of fossil forms of certain groups, such as larks, crows, finches, etc., is well determined. Contemplation of the embryonic condition of birds gives retrospective glimpses and hints at the ancestry of groups of birds, but it is by palaeontological methods that those fundamental structural characters are revealed which lead to the establishment of laws and exact relationships, and it is along this line that the ancestry of birds must be sought.

CLASSIFICATION

No ornithologist can fail to be interested, as well as instructed, by a perusal of the various arrangements of birds proposed by different authors, from Linnaeus to Stejneger, Fürbringer, and Gadow, which may be found in Bronn's Klassen und Ordnungen des Thier-reichs (Band. VI., Abth. 4., Voegel. Leipsig: 1893. Pp. 1 to 303). It is well understood that no classification yet proposed is satisfactory—all are necessary and helpful rather than exact.

Palaeontologists are disposed to emphasize the toothed and the toothless condition, as will be seen by the following classification; while this may not be a true basis of classification it is at least very suggestive, and for that reason is here adopted.

CLASS AVES (BIRDS)

Sub-class Archaeornithes (Ancient Birds)

Division 1—Saururae (Lizard-tailed)

Toothed

Order 1—Archaeopteryges: *Archaeopteryx* (p. 15).

Sub-class Neornithes (Recent Birds)

Division 2—Ratitae (without a keel)

Toothed series

Order 2—Odontolcae: *Hesperornis* (p. 21).

Toothless series

Order 3—Aepyornithes: *Aepyornis* (p. 27).
Order 4—Apteryges: *Apteryx*, Kiwi (p. 28).
Order 5—Dinornithes: Moas (p. 28).
Order 6—Megistanes: *Casuarius*, Cassowary; *Dromaeus*, Emeu (p. 29).
Order 7—Rheornithes: *Rhea*, American Ostrich.
Order 8—Struthiornithes: *Struthio*, Ostrich.
Order 9—Stereornithes: *Phororhacos* (p. 30), *Brontornis*, *Stereornis*.
Diatryma, *Dasornis*.
Gastornis (p. 31).
(Of very doubtful position. Probably degenerate carinates, belonging near Gruiformes.)

[Division Odontolcae placed here by most taxonomists.]

Division 3—Carinatae (with a keel)

Toothed series

Order 10—Odontormae: *Ichthyornis* (p. 31).
Apatornis.

TOOTHLESS SERIES

Order 11—Colymbiformes: Colymbi—Divers.
Order 12—Sphenisciformes: Sphenisci—Penguins.
Order 13—Procellariiformes: Procellariae.
Order 14—Ciconiiformes: Steganopodes—*Sula*, Gannet.
Phaethon, Frigate bird.
Phalacrocorax, Cormorant.
Odontopteryx (p. 33).
Ardeae—*Ardea*.
Ciconiae—*Leptoptilus*, Adjutant.
Ciconia, White Stork.
Phoenicopteri—Flamingoes, etc.
Order 15—Anseriformes: Palamedeae—Screamers.
Anseres—Mergansers; Ducks; Geese; Swans; Spur-winged Goose; *Odontopteryx* (according to some).
Order 16—Falconiformes: Cathartae—American Vultures.
Accipitres—Falcons, Vultures, *Harpagus*, *Gypogeranus*, Secretary-bird.
Order 17—Tinamiformes: Tinami—Tinamus.
Order 18—Galliformes: Galli—Fowls; Peacock.
Opisthocomi—Hoatzin (p. 22).
Order 19—Gruiformes: Cranes. (Phororhacos possibly.)
[Stereorinthes (*Phororhacos*, *Gastornis*, etc.) placed here by some: their probable position.]
Order 20—Charadriiformes: Limicolae—Plovers, etc.
Lari—Gulls.
Alcae—Great Auk (p. 35).
Pterocles—Sand grouse.
Columbae—Pigeons.
Ground-pigeons; Dodo (p. 35).
Solitaire (p. 35).
Order 21—Culiciformes: Cuculi—Cuckoos.
Psittaci—Parrots, etc.
Order 22—Coraciiformes: Coraciae—Roller, Hornbill, Hoopoe.
Striges—Owls.
Caprimulgi—Goatsuckers.
Cypseli—Swifts, Humming-birds.
Colii—Colies.
Trogones—Trogons.
Pici—Tucans, Woodpeckers.
Order 23—Passeriformes—Crows, Larks, Sparrows, Warblers, etc. 11,000 known species

Those who are interested in the geological history of birds will find a great deal to please and instruct them in the Animals of the Past by Lucas, in the Extinct Monsters by Hutchinson, and in the Dragons of the Air by Seeley. Readers desiring more technical treatises may consult Vertebrate Palaeontology by Woodward, Manual of Palaeontology by Nicholson and Lydekker, Handbuch der Palaeontologie by Zittel, Palaeontologie by Steinmann-Doederlein, and Palaeontologie by Bernard. In these will be found bibliographies and complete references to other works and to special papers on particular subjects concerning avian phylogeny and anatomy.

A STORY THAT ENDS RIGHTLY

FRANK H. SHOEMAKER, OMAHA

One October day a hunter, for want of better game, shot at a red-shouldered hawk, and the bird fell to the ground, alive, and to all appearances uninjured. Not a drop of blood was to be seen, and not a feather was cut by the shot, but the bird seemed to have lost the use of its wings. It was brought to town and given to a bird student, and a day or two later was loaned to the writer as a subject for the camera. The bird was taken home in a large pasteboard box and placed temporarily upon a perch in the furnace room while the camera and six plates were prepared. A little patch of natural woodland near by was chosen as the most suitable place for photographing the bird. The camera was placed accordingly, focused upon the horizontal trunk of a gnarled cherry-tree. When all was ready, the hawk was coaxed to perch upon a short stick, and thus carried, without any restraint, to the place chosen. Twice the bird expanded its wings, but made no effort to fly. It was placed upon the cherry-tree and settled contentedly, though keenly watching every movement in the manipulation of the camera. Over half an hour was taken to expose the six plates, the position of the camera and the size and attitude of the subject being varied for each exposure, the frontispiece of this number of the Proceedings being the most satisfactory of the series, though every plate was good. When the sixth plate was in the camera, and immediately after its exposure, the hawk, as though waiting for that event, suddenly spread its wings and mounted strongly above the tree-tops. Round and round it circled, going higher and higher, until over a hundred yards from the ground, when it settled into a steady flight southward, with not a sign of weakness or wavering in the action of its wings, finally disappearing in the distance.

There was a considerable degree of discomfort in the memory that the bird was a loan, but when the owner heard the details he declared himself perfectly satisfied, as everyone should be.

WATER FOR BIRDS

ELSIE PEPOON, TABLE ROCK

Last summer during the hot weather a small pond near our home, where the birds were in the habit of drinking and bathing, went dry. Not wishing the birds to go so far away for water, we had a strong platform built in the crotch of a large mulberry tree that stood about twenty-five feet from the house. The bottom of an old jug that could be filled to an average depth of three inches was filled and placed on it, and we awaited results. The platform was low—only

about five feet from the ground; but it was astonishing how soon the birds found it and how liberally it was patronized all summer and late into the fall.

There is an inclosed porch on that side of the house which is used as a sitting-room in the summer time. The birds soon became so fearless that they paid no attention to anyone sitting there quietly reading or working, and little to one moving about.

Robins, brown thrashers, catbirds, blue jays, and wrens were the most frequent visitors, though sparrows, chickadees, warblers, vireos, goldfinches, orioles, and rose-breasted grosbeaks came often. Flickers and downy woodpeckers would come sidling down the tree, and I even saw a wood thrush there early one morning. I think they visited it every morning, as I often saw them near by and always heard them singing there before rising, and again late in the evening.

The Wood Thrush has been a summer resident at "The Syringas" for several years. There were four pairs of them here the past summer. I only know of two other places in this locality where they were found, both down on the river.

The blackbirds never came near, which surprised me, as they are so numerous and so tame. Nor did the barn swallows, though one pair built under the eaves of the house.

The Yellow-billed Cuckoo is generally considered a shy bird, but he was one of the boldest and most frequent visitors. When he appeared all other birds promptly retired to the treetop. He leisurely drank his fill or took his bath, paying no heed to my sister and I as long as we sat quietly sewing. Then he would hop to a nearby limb, carefully arranging his feathers, the other birds looking on respectfully.

I think one reason why the birds became so tame was that the mulberry tree stood in a tangled rose garden with lilacs, osage oranges, and other shrubs close by where they could retire if frightened. And we had no cats!

FROM A WOMAN'S STANDPOINT

NELL HARRISON, YORK

(Abstract)

Men study the birds; women study about the birds. Men can go freely into the field and follow the birds everywhere, while fashion and conventionality debar women from the same privilege. The disadvantages under which women labor are responsible for the absence of a woman's name in the roll of great ornithologists. And yet the most popular "bird books" of the present day have been written by women.

The examination of recent fiction betrays the fact that many writers neglect entirely the opportunity afforded by the use of birds, while

none make use of it as they might. Other natural objects are used in description, birds not. How strikingly does Booth Tarkington's "A woodpecker's telegraphy broke the quiet like a volley of pistol shots," emphasize the silence, and how effective in many places might be made a reference to the appearance of a bird or to its song. In the "Redemption of David Corson" the author refers in a very effective manner to birds, using them forty-six times and including twenty-nine species, while his descriptions are many of them very good, especially one of the song of the Catbird. Yet this book stands alone; in other recent fiction references to birds are few, and in "David Harum" not a single one appears. That readers appreciate such is evidenced by the rapidly increasing popularity of "nature books."

The average person when in the country notices flowers more than birds, and this is not because of lack of interest in all things beautiful and attractive, but because of lack of education in that particular direction. It is hard to arouse the interest of an adult in new subjects, while children eagerly grasp new ideas, and seize with avidity on new objects of interest. At the same time their ramblings in woods and fields bring them frequently in contact with birds.

In the writer's own teaching she finds the use of birds most effective in aiding her to reach the hearts and minds of the children. She talks to them ten minutes each day about birds and nature and frequently the presence of a bird outside the schoolroom window or the sound of its song is made use of to arouse the imagination of the pupil and add to his interest in his work. Their interest once aroused, the children soon learn to love the birds and are easily enlisted in the cause of bird protection.

One object of this Union is the fostering of the cause of bird protection. This can best be attained by laying hold of the children; but they must be reached through the teachers, who are often indifferent and who, being usually women, are unable to study birds with the freedom enjoyed by the men. We must seek to interest these teachers and, having aroused their interest, to furnish them with such opportunities that their interest will not flag.

TEN YEARS WITHOUT A GUN

WILSON TOUT, DUNBAR

A school teacher should be very careful in his habits of life that he chooses the best things, for he is a living example of every doctrine or precept which he expounds. Pupils watch his actions and discuss his motives. They imitate his faults rather than his virtues, for it is only this excuse that they need to satisfy their consciences in matters of doubtful morality. And that is the reason why I do not own a gun.

I have wanted one often and at times it has seemed as though I must get one if I should attempt to study the birds any further. But I knew that the first time I killed a specimen for identification my motive would be misunderstood and I should be accused of inconsistency; for in school and out I urge bird protection constantly. This is my reason for not having a larger list of birds, but balanced with the harm I might have done I am well satisfied.

In the present paper I shall not attempt to give a complete scientific list of the birds I have noted, but shall give only those which are in any way unusual or about which I have some observation which I think to be of interest. They are not arranged according to any scientific plan, but I have given them as they came to my mind or were suggested by some previous observation.

If you take a map of Nebraska and with the center at York draw a radius of fourteen miles, this circumference would inclose my field of observation. Along the east and west diameter runs a small stream called Beaver Creek. The Big Blue River runs in a parallel direction nine miles south and a small creek five miles north has the same easterly direction. Between these are strips of rolling prairie or farm lands, mostly under cultivation and devoid of native trees. Along the streams are scant belts of timber, nearly all being new growth. In these strips were located a number of basins which usually held standing water of varying depth. But with the advance of settlement and owing to their value as farm land these have nearly all been drained and are now cultivated fields.

One large basin southwest of York covered nearly 600 acres and was from three to forty inches deep. In most parts grew a rank growth of marsh grasses and willows, which afforded protection and nesting places for a number of waterfowl. During the summers of 1896 and 1897 I found in this basin nests of Least and Black Tern, Sora Rail, Pied-billed Grebe, Coot, Blue-winged Teal, and Yellow-headed Blackbird. The Black Tern nested in colonies of from three to ten pairs in a bit of open shallow water. Their nests were always built up above the water level although saturated with moisture. The nests of the Least Tern were not over the water but on the banks and only one of five contained three eggs, the other four recorded having two each until incubation was well advanced. I was informed by prominent ornithologists to whom I sent the eggs for identification that this was the first known instance of the nesting of Least Tern in Nebraska.* One nest of the Sora Rail contained eighteen eggs while two more contained fourteen each; these nests were built in the tall grass over the shallower water. In the weeds growing in the deepest places the Yellow-headed Blackbird placed its basket nests. These contained three or four eggs, only one nest with five being seen. This basin is

* But L. Skow had also found it breeding at Cut-off Lake near Omaha, which fact was referred to in Bruner's Notes on Nebraska Birds, published in April, 1896.—Ed.

now under cultivation. With the passing of these basins such forms of bird life do not stay with us during the summer but are merely migrants in spring and fall. So with the breaking of the prairies the Burrowing Owl and Pinnated Grouse have become quite scarce in most places.

Because of the scarcity of big timber a long list of Raptores would not be expected. However I have records of the nesting of the Great Horned Owl, Barn Owl, Screech Owl, and Barred Owl. A farmer near Utica took four young barn owls from a pigeon-box on his barn during the latter part of the summer of 1899. He had noticed the parent birds about all summer and had also noticed that his pigeons were slowly disappearing. The young owls were given away, two being brought to school where they were kept for several days. They did not live long in captivity, probably because they did not have their customary pigeon diet. I once found two eggs of the Great Horned Owl in an old crow's nest and have seen the birds at various times throughout the year. Five years ago I caught four young screech owls and put them in our barn loft. We fed them fresh meat and that was all, for we could not get them to eat anything else or to drink water. They grew to be full grown and finally escaped through a broken window. I also had a burrowing owl in the loft at the same time but it absolutely refused every kind of food and after three days' fasting tried to crawl through a knot-hole and got caught. The next morning we found it hanging cold and stiff. A short-eared owl was found by some girls in a grove and brought to school. It had been wounded in some way and could not fly.

Of the hawks we have the Cooper's, Sharp-shinned, Red-shouldered, Red-tailed, Swainson's, Sparrow, and Marsh. These I know and then there are some which I do not know and some of which I am not certain. That is because I have no gun. In October, 1896, I took a ride to a place twelve miles northwest of York and saw over a hundred Swainson's hawks. They were common during the whole of the last part of the month and seemed to be migrating very slowly. In 1898 a boy caught a turkey buzzard and gave it to his sister for a pet of course she did not keep it long. A lady showed me a sharp-shinned hawk in November, 1900, which had been found dead a few days before.

Nighthawks are most common during migration, but a few remain as summer residents and breeders. In the high banks along the Blue I have found the nests of the Bank Swallow and Kingfisher, neither of which are very common.

Of the shore birds I do not believe we have many breeders. The Bartramian Sandpiper and Killdeer are seen throughout the summer and the Least and Solitary Sandpipers during migration. The York High School has a double-crested cormorant, a white pelican, an avocet, and a black-crowned night heron, all of which were taken on the creek near there during migration. March 30, 1896, I gave a cigar

in exchange for a dead sandhill crane which some hunter had brought in from a pond near the city. It was from a flock of seven migrants and had been killed "just for fun."

The Green Heron is occasionally found nesting but the Great Blue Heron and American Bittern are migrants only, so far as I know now. A boy had two Franklin's gulls in a box April 21, 1900, that he had caught after their wings had been shot to pieces as they were passing over in migration.

Of the timber birds the Chickadee is the most abundant resident and breeder. They are not found away from the streams. I have seen many ruby-crowned kinglets in winter and had a golden-crowned kinglet brought to school. It had been caught by a cat and rescued too late to save its little life. I have only single nesting records of the Red-eyed Vireo, the Wood Thrush, and Bobolink, and do not believe they are common breeders with us. I once found a long-billed marsh wren's nest containing one egg. This nest was over the water in the mill-pond, within the city limits. The Bohemian Waxwing is an irregular winter visitant and to a certain extent the American Crossbill is also. They appear in flocks during some winters and then we do not see them again for a year or two.

June 7, 1896, I found a blackbird's nest containing two eggs in a low elm tree near a pond west of York. Both the bird and the eggs were so unusual that after waiting two days, and the nest being apparently deserted, I took the eggs and blew them. They have been identified by a good authority as those of Brewer's Blackbird. I have since identified the bird as a migrant but have never heard of their breeding here except that one time.

The Lark Bunting is an irregular summer resident and breeder, being observed most abundantly in 1896. Skipping a year or two occasionally, it seems to follow the seasons, becoming rare in rainy or wet years and quite common during years of drouth. A black-headed grosbeak was brought to school by a boy who had shot the bird by mistake for an English sparrow. This was in the sping of 1897 and since I have observed it only once or twice in late spring.

I believe we are near the western limit of the Crow in Nebraska. We have a few as permanent residents but they are not many. Sometimes a person may drive a whole day and not see one. By far the commonest summer resident we have is the Mourning Dove, and they seem to increase in numbers with each season. I do not think a few men with guns would do any harm if they were to kill nothing but doves, for they are quite harmful to stacked grain in the fall and especially to grain in the shock.

I have about a hundred birds on my list which were observed or examined without the shooting of a single specimen. The list is by no means complete and only a few have been given here, but I hope this may be of some interest to the members of the Union.

A PAIR OF YOUNG BARRED OWLS

ELIZABETH VAN SANT, OMAHA

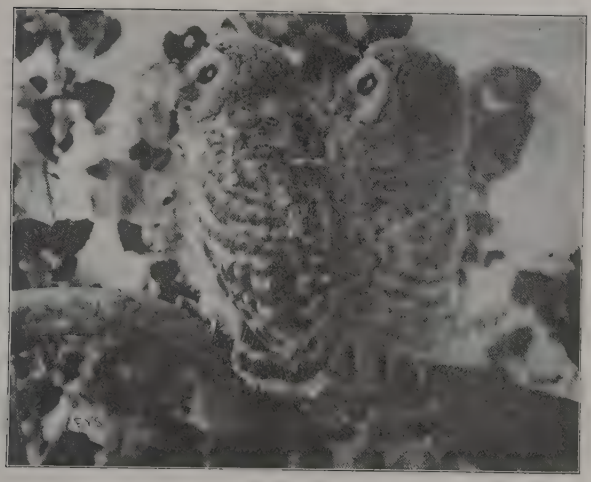
Probably the most unique of the many young birds I have adopted, either temporarily or permanently, were a pair of barred owls. They had emerged from their nest one morning about the first of May and were sunning themselves on the nearest branch when they were discovered by a bird student. The branch was in a conspicuous place over a much-traveled path in the woods, and knowing that they would most likely furnish a target for some of the numerous gunners who would pass that way, the young man had brought them to the city and given them a temporary home in a show window. They came into my possession at first as a loan for photographic purposes, and afterwards the responsibility of their future was given into my hands. When I first saw them they were about nine inches high, covered with long, soft feathers, even in their immaturity showing distinctly the bars that give the species its name. Their feet and legs were covered with thick, white down.

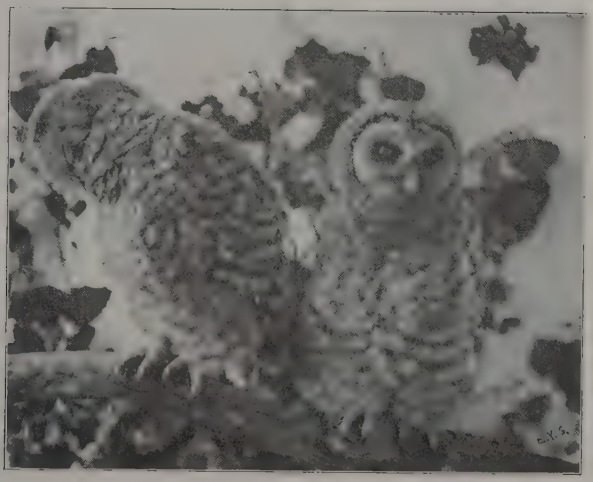
They were given a room ten feet square, provided with suitable branches for perches. They were perfectly friendly, and would take food from the hand, and allow one to go close to them. Too great familiarity, however, aroused their indignation. They especially disliked having their feet or legs touched, expressed their disapproval by stamping and moving away, and when at a safe distance examined the irritated place critically and scratched it with the bill. One of them from the first snapped his bill when any one entered the room, although it was some time before the other acquired the habit.

They resented too much handling, and always preened their feathers after they had been held or stroked.

The owls were fed mainly on raw beef, although they relished June beetles, which they soon learned to hold in their claws and tear to pieces with their beaks. Their appetites varied; some days they would eat very little and at other times they fairly gorged themselves. They invariably blinked their eyes solemnly when they swallowed anything. Their only vocal effort was a prolonged, half breathing, half whistling sound, which they uttered chiefly when their food was taken to them. They snapped their bills violently when disturbed, or when handled in a way not wholly to their liking. Their actions were most interesting. They seemed more like a quaint old couple than like a pair of infants. Every moving thing attracted their attention. They watched the flies on the window or floor, following every movement, and occasionally reaching to catch them with their claws. They stared long and solemnly at any strange object on the floor, bending their heads down to a level with their feet. Even at their early age, they had the peculiar circular movement of the head characteristic of the owl kind.

PLATE II





YOUNG BARRED OWLS

PLATE III

YOUNG BARRED OWL

PLATE IV

YOUNG BARRED OWL

In the evening the passing trolley cars, two blocks away, were a source of constant wonderment to them, and with outstretched necks they would peer after the mysterious lights until they were out of sight. Apparently their vision was as perfect in the daytime as at night. One of their peculiar traits was to stare intently at the sun for minutes at a time. They were furnished with a pan of water, and one at least took pleasure in bathing, after his own fashion, which consisted in standing in the water "waist deep."

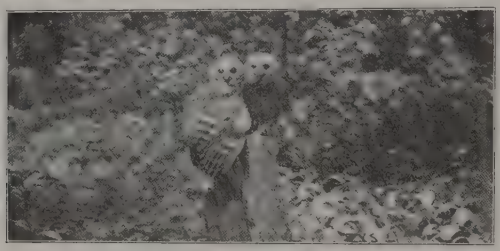
They were very sociable, following each other from place to place and sleeping close together. They were as cautious in moving about the branches as though a fall would be a dangerous experience, although they could fly from perch to perch and alight with the greatest accuracy.

One of the owls liked to be stroked, and gave every evidence of enjoying the sensation of having his feathers smoothed. The other, however, was not so inclined, and would indignantly edge away sidewise the whole length of a branch to escape the ordeal.

They had a most peculiar and apparently uncomfortable way of sleeping. Perching upon a limb, they would settle themselves with the head hanging far down on one side of the limb and the tail on the other. They would rest in this way for an hour or two in the middle of the day, and sometimes in the latter part of the afternoon. When visited after dark, they were invariably awake and active.

They gradually became more wild, striking most wonderful attitudes with outstretched wings and snapping bills when any one entered the room. Their growing activity made their room seem altogether too small for them, and when at the end of three weeks they had learned to swoop down upon their food instead of waiting to be fed, and to pounce accurately upon the hapless June beetles they liked so well, they were considered ready for freedom. They were accordingly packed in a large basket covered with cloth, taken on the train to a station in Iowa, and from there carried a considerable distance to a large piece of woodland, away from the railroad and highway, where it was believed they would be free from gunners and allowed to live their lives in peace and happiness. They had been many hours in their narrow prison, and it was interesting to see them when they took their first taste of liberty. Although they had never had a chance to fly farther than from one side to the other of a room, their first flight in the woods was a hundred yards down a shady vista. I had taken my camera and a dozen plates, expecting to get some good pictures of them in natural surroundings, and this sudden taking of themselves off was contrary to the program. They had alighted upon the ground and were easily recaptured and brought back. But their one taste of freedom made them a part of the wild, and they were no longer the docile subjects to which I had been accustomed. Both threw themselves on their backs and fought and scratched vigorously. After many

efforts and many wasted plates, they were induced to perch upon a stump for the fraction of a second while a single snapshot was taken. A second snap was just in time to catch a streak showing the direction in which they had taken their flight.



GOOD-BYE

NOTES ON THE DISTRIBUTION AND HABITS OF THE BLUE GROSBEAK IN NEBRASKA

MYRON H. SWENK, LINCOLN

Although it is a most interesting and quite widely distributed bird, very little has been written in regard to the Blue Grosbeak, *Guiraca cærulea* (Linn.). Typically, it is a species of the southeastern United States, but it ranges northward to southern Pennsylvania, southern Illinois, and north central Nebraska, and accidentally even to New England and Canada, and westward to Colorado and western Texas. In winter it extends south to Cuba and southern Mexico. In the western and southwestern United States it is replaced by a slightly different subspecies, *Guiraca cærulea lazula* (Lesson), which ranges from southern Utah and Nevada, and California, east to Colorado, Western Kansas and Texas, and south to southern Mexico, and in winter even to southern Costa Rica. This western form has also been reported from Nebraska, but only from the southwest corner. Although no specimens have been examined to prove the contention, its occurrence there is quite probable, for one or the other form is known to be a common bird in that region. The eastern form breeds throughout its United States range, but nowhere can it be considered a very abundant bird.

In Nebraska the eastern form extends locally over at least the eastern half of the state. Breeding records from Red Cloud on July 2, and from Broken Bow on July 8, 1893, are accredited to A. K. Fisher, and it is a very common summer resident in the Niobrara valley as far west as Brown County, the specimens from Kennedy and Long Pine referred to by Rev. Mr. Bates (Second Proc. N. O. U., p. 75) also proving to be the eastern form. In eastern Kansas it breeds quite commonly. In the

vicinity of Beatrice, where my observations were made, it is a fairly common summer resident, while here at Lincoln, only forty miles north, it was never observed until the past spring when a pair was seen by R. H. Wolcott, and this although the locality had been thoroughly worked by several active ornithologists. These records seem to indicate that its distribution in this state is very local. Possibly another reason for its apparent scarcity in some localities is its inconspicuous plumage, which though bright enough in the hand, appears blackish at a short distance in the field, unless observed under exceptionally good conditions. Because of this the bird is apt to be overlooked or confused with commoner birds. Having once become familiar with its ways, however, it is easily distinguished and frequently in evidence. At least this has been my experience with it.

I first met with the bird near Beatrice, September 16, 1899. The day was rainy, and I was returning late in the afternoon from a day's collecting trip when I noticed a flock of birds which appeared quite new to me, feeding in some sumac bushes. I shot one and it proved to be a female blue grosbeak. The flock contained a dozen or so birds, and every one must have been a female or young male, for I recollect looking carefully for a bird different from the one I had shot, and failing to find one. The birds were tame and did not take flight at my shot. Later observations have shown that it is the habit of this bird to gather in such flocks shortly before the autumnal migration, and curiously enough, the females always greatly predominate in number. Where the males are at this time I have been unable to determine.

I did not meet the bird again until August 8, 1900. On this date I secured an adult male, having been attracted to it by its song, and on the next day a pair was seen at the same place, but none shot because from the actions of the birds I suspected that they had young near. A few days later another pair with fully fledged young was found in a large clump of sumac bushes along a railroad track, and within a half mile of the first pair. I caught one of the young to see what the parents would do.

Their behavior at this time was very interesting. The male remained quite shy and did not venture within gun range, but flew excitedly from tree to tree and uttered incessantly the call note, a sharp and rather metallic "chink." The female was very tame, almost bold, and allowed me to approach within a few feet of her, she too uttering the call note excitedly and occasionally flying by, quite near my head. On releasing the young bird the male subsided into quiet, but the female continued the scolding as long as I remained near.

Last year (1901) the grosbeaks arrived about the first week in May, and resorted to the same places in which I had found them the preceding year. The preferred spots seemed to center along a small creek with tall cottonwoods and thin underbrush opening out to a broad weed and sumac covered pasture. Here two pairs spent the

summer, but all my efforts to locate a nest were in vain. The male was always too shy to be observed well, and because of her plain plumage the female was very elusive and could disappear in the trees or brush with exasperating ease.

Their motions are generally slow and deliberate, especially when feeding, much in contrast with the liveliness of the Cardinal. But like that bird they are near the ground a great deal of the time. The male has a fancy for telegraph wires, and seems to enjoy keeping a certain distance ahead of the observer for a time, and then coming back to the place of starting by making a wide semicircle, much as is the habit of the Northern Shrike. Again he will sit quite still for a considerable length of time, like a flycatcher. Blue grosbeaks are solitary birds, and during the breeding season I have never seen more than a pair with their young together; indeed, each pair occupied opposite ends of the wood.

In addition to the somewhat sparrowy note already mentioned, the male Blue Grosbeak has a beautiful, warbling song something like that of the Rose-breasted and fully as sweet, but much softer. It sounds as though the bird was singing quietly to himself. I have never heard the female sing. When singing, the male prefers an elevated perch, as a tree or telegraph wire, and fortunately at such times allows a closer approach than usual.

Their food consists of weed seeds and sumac berries, and a considerable number of insects, especially beetles, are eaten. As near as I can determine they leave for the south the third week in September.

SOME BIRDS FOUND AROUND DUNBAR DURING THE WINTER MONTHS

E. H. JONES, DUNBAR

Born and brought up at Dunbar and with an innate fondness for hunting, I naturally acquired an interest in birds, which has increased materially since the organization of our Union. It is only recently, however, that I have kept any exact data, from which I have tried to prepare a list of our winter birds, including herein only birds that were seen after winter had actually set in.

172. *Branta canadensis* (Linn.).—Canada Goose. A few flocks seen during January of this year. They feed in the wheat fields during the day and fly over to the Missouri River at evening.

289. *Colinus virginianus* (Linn.).—Bob-white. A common resident.

305. *Tympanuchus americanus* (Reich.).—Prairie Hen. A very few flocks.

316. *Zenaidura macroura* (Linn.).—Mourning Dove. Some few winter here, staying about the feed-yards. On January 22, 1902, a boy shot two in an orchard near here.

337. *Buteo borealis* (Gmel.).—Red-tailed Hawk. Common.

360. *Falco sparverius* Linn.—American Sparrow Hawk. On December 24, 1900, I shot one in a cottonwood grove. Hardly think it winters here.

367. *Asio accipitrinus* (Pall.).—Short-eared Owl. January 1, 1900; December 21, 1900.

373. *Megascops asio* (Linn.).—Screech Owl. One of our common winter birds.

375. *Bubo virginianus* (Gmel.).—Great Horned Owl. January 12, 1902.

393. *Dryobates villosus* (Linn.).—Hairy Woodpecker. About one to every three of the Downy. It is more numerous here than around Lincoln.

394*c*. *Dryobates pubescens medianus* (Swains.).—Downy Woodpecker. Quite common.

409. *Melanerpes carolinus* (Linn.).—Red-bellied Woodpecker. Not common. January 1, 1900; December 25, 1902.

412*a*. *Colaptes auratus luteus* (Bangs).—Yellow-shafted Flicker. A few stay throughout the winter.

474*b*. *Otocoris alpestris praticola* Hensh.—Prairie Horned Lark. January 26, 1900; January 1, 1902; January 23, 1902.

477. *Cyanocitta cristata* (Linn.).—Blue Jay. Three of these birds have been wintering here this season in a piece of timber a half mile north. Have noticed a few single ones at different times.

488. *Corvus americanus* Aud.—Crow. Abundant; seemingly more numerous in winter than at any other time, which is perhaps due to its being more gregarious and more readily seen at that season. On January 25, 1902, on a moonlight night, a friend and myself visited a crow roost five and one-half miles north of Dunbar. A short time after we had entered the grove a single crow some distance ahead of us cawed three or four times. As we approached, he repeated the call. This seemed to be the signal for a general alarm, for although we were more than a hundred yards away, the whole flock, numbering several hundreds, rose from the tops of the elm and ash trees, cawing wildly. They circled about in the air at quite a height. We retreated some distance and in twenty minutes they had settled down to their roosts again.

501*b*. *Sturnella magna neglecta* (Aud.).—Western Meadow-lark. December 24, 1900; January 12, 1902; January 22, 1902.

529. *Astragalinus tristis* (Linn.).—American Goldfinch. Seems scarce around here this winter. Saw one flock December 25, 1901.

536. *Calcarius lapponicus* (Linn.).—Lapland Longspur. December 25, 1901.

553. *Zonotrichia querula* (Nutt.).—Harris's Sparrow. These birds were here in large flocks till the first of November when the majority migrated leaving a few which I have noticed several times during the winter in a sheltered patch of hazel brush.

559. *Spizella monticola* (Gmel.).—Tree Sparrow. Arrived early in October and have been common since.

567. *Junco hyemalis* (Linn.).—Junco. Have noticed juncos during every walk in the woods this winter.

581. *Melospiza melodia* (Wils.).—Song Sparrow. A few are wintering here in some brush piles not far from my home.

593. *Cardinalis cardinalis* (Linn.).—Cardinal. One of our common winter birds.

621. *Lanius borealis* Vieill.—Northern Shrike. Common.

722. *Olbiorchilus hiemalis* (Vieill.).—Winter Wren. December 23, 1900; December 2, 1901; January 12, 1902. On each occasion it was in a pile of brush.

726. *Certhia familiaris americana* (Bonap.). Brown Creeper. Seen on almost every bright day that I visited the woods.

727. *Sitta carolinensis* Lath.—White-bellied Nuthatch. Quite numerous.

728. *Sitta canadensis* Linn.—Red-bellied Nuthatch. Rare. January 19, 1902.

731. *Parus bicolor* Linn.—Tufted Titmouse. November 10, 1901; January 15, 1902.

755*a*. *Parus atricapillus septentrionalis* (Harris).—Long-tailed Chickadee. Very common.

761. *Merula migratoria* (Linn.).—American Robin. Saw one on December 22, 1901, in a sheltered draw.

Summing up, I find that the list includes nineteen permanent residents, eight winter visitants, and five stragglers. I am satisfied that this does not represent nearly all of our winter birds, and I hope, in time, to be able to add to it.

OUR WINTER BIRDS

MYRON H. SWENK, LINCOLN

Beginners in the study of field ornithology are generally advised to commence their observations in winter when the bird life of our northern states is at a minimum, and the different species are more easily distinguished. At this season it would not be impossible for them to walk for miles without seeing a single bird. To such persons it must be surprising to state that more than one-fourth of the entire avifauna of Nebraska is made up of winter birds.

These fall naturally into two distinct classes; those which are present in the same locality throughout the year, or *resident* birds, and those which are present only in winter, or *winter residents* and *visitants*. The species of birds, as well as the number of individuals present, depends in many cases directly upon the weather, and a list of birds of a certain locality found in a mild winter differs materially from a list of those found in a severe one. The presence of other birds depends upon the food supply, and they remain with us only when food is unusually abundant, or, in the case of those birds that breed far north, when the food supply is deficient in their summer home. This often forces birds, usually non-migratory, into our boundaries, and at rare intervals brings down certain species in immense numbers.

Many aquatic birds such as gulls and ducks remain until the small streams and ponds of our state are frozen over, when they retire just far enough to find open water. Sandpipers often remain well into November, or until the edges of the ponds become too frosty to be probed by their bills. All owls, most hawks, and our land game birds

are resident in this state. Among the smaller birds the sparrow family is most abundantly represented in winter, although the majority of the woodpeckers are also present. These are, of course, either grammivorous or larvæ-eating birds. Strictly insectivorous birds such as flycatchers, warblers, or vireos are almost if not entirely absent in winter, for they generally depart as soon as the insect supply begins to wane.

With this great variation in the character of our winter bird life, according to the conditions, considerable difficulty is experienced in attempting to determine when a bird ceases to be a summer resident or fall migrant and becomes a winter resident or visitant. In this paper I have chosen to consider as a true winter bird every species that has been found in the months of December, January, or February. The list is a compilation of all unquestionable published articles on the subject, together with my own notes, and those of various members of this Union, who are in every case accredited with their notes or dates. While certainly incomplete, the list represents fairly well our present knowledge of the subject, and forms a basis for future work.

130. *Merganser serrator* (Linn.). –Red-breasted Merganser. Seen on Platte River in mid-winter (L. Bruner).

132. *Anas boschas* Linn.—Mallard. Common throughout the winter if the water is open. Beatrice, January 29, 1901.

139. *Nettion carolinensis* (Gmel.).—Green-winged Teal. Common in winter. Many records.

143. *Dafila acuta* (Linn.).—Pintail. Present in winter; often migrates in February. January 22, 1899; February 8, 1898 (R. H. Wolcott).

146. *Aythya americana* (Eyt.).—Redhead. Remains very late and winters if open water is present.

147. *Aythya vallisneria* (Wils.).—Canvas-back. Remains late in November; arrives in February; probably present throughout mild winters.

151. *Clangula clangula americana* (Bonap.).—American Golden-eye. Winters. Long Pine, December 10, 1896 (J. M. Bates).

152. *Clangula islandica* (Gmel.).—Barrow's Golden-eye. Winters. South Bend, January 22, 1900 (L. Bruner).

154. *Harelda hyemalis* (Linn.).—Old-squaw. Rare winter visitant. Omaha. December 8, 1900 (J. E. Wallace).

165. *Oidemia deglandi* Bonap.–White-winged Scoter. Winter visitant, possibly winter resident. Omaha, December 8, 1900 (J. E. Wallace). The other Scoters are also probably present, but rare.

169. *Chen hyperborea* (Pall.).—Lesser Snow Goose. Found throughout November, returns in February. Beatrice, February 20, 1901.

172. *Branta canadensis* (Linn.).—Canada Goose. Common throughout ordinary winters. Platte River, January 22, 1900 (L. Bruner).

172*a*. *Branta canadensis hutchinsii* (Rich.).—Hutchins's Goose. Same as preceding, and found with it.

230. *Gallinago delicata* (Ord).—Wilson's Snipe. Winters somewhat commonly over the state. Many records.

289. *Colinus virginianus* (Linn.).—Bob-white. An abundant resident over most of the state.

300. *Bonasa umbellus* (Linn.).—Ruffed Grouse. Very rare in this state, but resident wherever found. Bellevue, winter of 1893 (I. S. Trostler).

305. *Tympanuchus americanus* (Reich.).—Prairie Hen. Very common resident.

307. *Tympanuchus pallidicinctus* Ridgw.—Lesser Prairie Hen. Very rare. Winter of 1871-72 (L. Bruner).

308*b*. *Pediocetes phasianellus campestris* Ridgw.—Prairie Sharp-tailed Grouse. Common resident in western Nebraska, uncommon eastward.

309. *Centrocercus urophasianus* (Bonap.).—Sage Grouse. Resident in extreme western Nebraska.

310*a*. *Meleagris gallopavo fera* (Vieill.).—Wild Turkey. Formerly a common resident, now very rare if present at all.

—— *Phasianus torquatus* Gmel.—Ringneck Pheasant. Barneston, December 3, 1900.

316. *Zenaidura macroura* (Linn.).—Mourning Dove. Common in ravines and cornfields in winter. Beatrice, December 25, 1899; January 1, 1901.

331. *Circus hudsonius* (Linn.). -Marsh Hawk. Resident, and probably our commonest winter hawk.

332. *Accipiter velox* (Wils.).—Sharp-shinned Hawk. Resident, common in winter. Beatrice, January 1, 1900.

333. *Accipiter cooperii* (Bonap.).—Cooper's Hawk. Common resident.

334. *Accipiter atricapillus* (Wils.). -American Goshawk. Uncommon winter resident. Sioux Co., February 24, 1896 (L. Skow).

337. *Buteo borealis* (Gmel.).—Red-tailed Hawk. Quite common resident.

342. *Buteo swainsoni* Bonap.—Swainson's Hawk. Resident, except in coldest weather (I. S. Trostler).

347*a*. *Archibuteo lagopus sancti-johannis* (Gmel.). -American Rough-legged Hawk. Common winter resident. Beatrice, February 25, 1898; January 13, 1900.

348. *Archibuteo ferrugineus* (Licht.).—Ferruginous Rough-leg. Common resident, especially westward. Neligh, December 25, 1899 (M. Cary).

349. *Aquila chrysaetos* (Linn.).—Golden Eagle. An uncommon resident.

352. *Haliaetus leucocephalus* (Linn.).—Bald Eagle. Seen in winter; rare.

354*a*. *Falco rusticolus gyrfalco* (Linn.).—Gyrfalcon. Rare, from the north. Norfolk, West Point (L. Bruner).

355. *Falco mexicanus* Schleg.—Prairie Falcon. Resident in western Nebraska. Sioux Co., February 25, 1896 (W. D. Hunter).

356. *Falco peregrinus anatum* (Bonap.).—Duck Hawk. Rare. Lincoln, December 8, 1900 (M. A. Carriker, Jr.).

357. *Falco columbarius* Linn. -Pigeon Hawk. Common in spring and fall, rare in winter. Long Pine, December 29, 1897 (J. M. Bates).

365. *Strix pratincola* Bonap. -American Barn Owl. Known to be resident at Lincoln (R. H. Wolcott).

366. *Asio wilsonianus* (Less.).—American Long-eared Owl. Common resident.

367. *Asio accipitrinus* (Pall.). -Short-eared Owl. Common resident, frequenting protected ravines in winter.

368. *Syrnium nebulosum* (Forst.).—Barred Owl. Somewhat rare resident.

370. *Scotiaptex cinerea* (Gmel.).—Great Gray Owl. A very rare winter visitant. Omaha, December 17, 1893 (I. S. Trostler).

371. *Nyctala tengmalmi richardsoni* (Bonap.).—Richardson's Owl. Rare winter visitant. Lincoln, December 10, 1892 (L. Bruner).

372. *Nyctala acadica* (Gmel.).—Acadian Owl. Very rare in summer, uncommon in winter. Beatrice, December 7, 1900.

373. *Megascops asio* (Linn.).—Screech Owl. A quite common resident in eastern part of state.

375. *Bubo virginianus* (Gmel.).—Great Horned Owl. Uncommon resident.

375*a*. *Bubo virginianus pallescens* Stone.—Western Horned Owl. Resident westward, east in winter. Beatrice, December 20, 1898.

376. *Nyctea nyctea* (Linn.).—Snowy Owl. Winter resident, common in some winters. Beatrice, January, 1892; December 17, 1898.

377*a*. *Surnia ulula caparoch* (Müll.).—American Hawk Owl. Very rare. Recorded in November, 1891, but included because it is essentially a winter bird.

378. *Speotyto cunicularia hypogœa* (Bonap.).—Burrowing Owl. Common resident over the state, especially westward.

390. *Ceryle alcyon* (Linn.).—Belted Kingfisher. Remaining late and wintering when only small places are open on the creeks and rivers. Beatrice, December 29, 1899.

393. *Dryobates villosus* (Linn.).—Hairy Woodpecker. Resident, not very common.

393*d*. *Dryobates villosus hyloscopus* (Cab.).—Cabanis's Woodpecker. Resident in extreme western Nebraska. Sioux Co., December, 1895 (L. Bruner).

394*b*. *Dryobates pubescens oreœcus* Batch.—Batchelder's Woodpecker. Resident in extreme western part of the state. Sioux Co., February 19, 1896 (L. Bruner).

394*c*. *Dryobates pubescens medianus* (Swains.).—Downy Woodpecker. An abundant resident.

400. *Picoides arcticus* (Swains.). -Arctic Three-toed Woodpecker. Very rare winter visitant. Omaha, December 15, 1895 (I. S. Trostler).

406. *Melanerpes erythrocephalus* (Linn.).—Red-headed Woodpecker. Occasional in winter. Dunbar, December 4, 1899 (M. A. Carriker, Jr.).

408. *Melanerpes torquatus* (Wils.).—Lewis's Woodpecker. Long Pine, winters, but rare (J. M. Bates).

409. *Melanerpes carolinus* (Linn.).—Red-bellied Woodpecker. Nebraska City in winter (M. A. Carriker, Jr.).

412*a*. *Colaptes auratus luteus* Bangs.—Northern Flicker. Common in winter.

413. *Colaptes cafer collaris* (Vig.).—Red-shafted Flicker. Resident, commoner westward. Beatrice, February 23, 1899; January 13, 1900.

474. *Otocoris alpestris* (Linn.).—Specimens are taken in winter which agree perfectly with *O. a. hoyti* Bishop and others apparently referable to the true *O. alpestris* as defined by Oberholser.

474*a*. *Otocoris alpestris leucolæma* (Coues).—Pallid Horned Lark. Uncommon in winter, from the northwest. Several records.

474*b*. *Otocoris alpestris praticola* Hensh.—Prairie Horned Lark. Abundant resident in eastern Nebraska.

474c. *Otocoris alpestris arenicola* Hensh. Desert Horned Lark. Common resident westward.

475. *Pica pica hudsonica* (Sab.). -American Magpie. Resident westward, rare in winter.

477. *Cyanocitta cristata* (Linn.).—Blue Jay. Abundant in summer, common in winter.

484. *Perisoreus canadensis* (Linn.).—Canada Jay. Rare, from north in winter. West Point, Crawford (L. Bruner).

486. *Corvus corax sinuatus* (Wagl.).—American Raven. Resident wherever found in Nebraska, but now surely quite rare.

487. *Corvus cryptoleucus* Couch.—White-necked Raven. Two records for the state—Sidney (L. Bruner); Cherry Co. (I. S. Trostler).

488. *Corvus americanus* Aud.—Crow. Abundant resident.

491. *Nucifraga columbiana* (Wils.). -Clarke's Nutcracker. Extreme western Nebraska, rare resident.

492. *Cyanocephalus cyanocephalus* (Wied.). -Piñon Jay. Resident in western Nebraska. Sioux Co., February 19, 1896 (L. Bruner).

498. *Agelaius phœniceus* (Linn.). -Red-winged Blackbird. Occasionally winters about cattle yards (J. M. Bates).

501b. *Sturnella magna neglecta* (Aud.).—Western Meadow-lark. Very few wintering. December, 1897, several seen at Beatrice.

509. *Scolecophagus carolinus* (Müll.). -Rusty Blackbird. A few remain all winter (L. Bruner). Uncommon winter resident (M. Cary).

511b. *Quiscalus quiscula æneus* (Ridgw.).—Bronzed Grackle. This bird seems to be getting commoner as a winter bird. A flock of about thirty remained throughout the winter of 1900-1901, near Beatrice. They were observed frequently, and on February 5, 1901, a specimen was obtained. They were at all times very shy, and subsisted entirely upon waste grain, spending the greater part of the day in the fields. At night they roosted in a small cedar grove. Lincoln, January 22, 1900 (J. S. Hunter).

514. *Coccothraustes vespertinus* (Cooper).—Evening Grosbeak. Straggler in late fall and winter from northwest.

515. *Pinicola enucleator leucura* (Müll.). -Pine Grosbeak. Irregular winter visitor.

517. *Carpodacus purpureus* (Gmel.).—Purple Finch. Irregular migrant and winter resident (I. S. Trostler). Omaha, in winter (L. Bruner).

521. *Loxia curvirostra minor* (Brehm).—Red Crossbill. Common winter resident. Beatrice, January 14, 1901.

521a. *Loxia curvirostra stricklandi* Ridgw.—Mexican Crossbill. Neligh, December 9, 1898 (M. Cary). Under Ridgway's restriction of this form to New Mexico, Arizona, and southward, our form probably becomes *L. c. bendirei* Ridgw., Bendire's Crossbill. At least, the new form is recorded from Omaha (Ridgway).

522. *Loxia leucoptera* Gmel.—White-winged Crossbill. Rare winter visitor. West Point, Omaha, December, 1887 (L. Bruner).

524. *Leucosticte tephrocotis* Swains.—Gray-crowned Leucosticte. Common winter resident in western Nebraska. Sioux Co., February 18, 1896 (L. Bruner).

528. *Acanthis linaria* (Linn.). -Redpoll. An irregular but at times abundant winter visitor. Beatrice, February 20, 1899.

529. *Astragalinus tristis* (Linn.).—American Goldfinch. Abundant resident, found in small flocks in winter.

533. *Spinus pinus* (Wils.).—Pine Siskin. Irregular winter visitor, at times a common winter resident. Numerous records.

—— *Passer domesticus* (Linn.).—English Sparrow. Very abundant resident.

534. *Passerina nivalis* (Linn.).—Snow Bunting. Winter visitant, coming in flocks of considerable size. Several records.

536. *Calcarius lapponicus* (Linn.).—Lapland Longspur. Common winter resident, often found with flocks of horned larks. Replaced westward by *C. l. alascensis* Ridgw.

553. *Zonotrichia querula* (Nutt.).—Harris's Sparrow. Abundant in fall and spring, common in flocks throughout the winter. Beatrice, December 27, 1900; January 12, 1901.

559. *Spizella monticola* (Gmel.).—Tree Sparrow. Our most abundant winter sparrow.

559*a*. *Spizella monticola ochracea* Brewst.—Western Tree Sparrow. Common westward, straggling eastward over the state. Sioux Co., February 18, 1896 (L. Bruner).

566. *Junco aikeni* Ridgw.—White-winged Junco. Resident in northwest Nebraska. Sioux Co., February 18 to 29, 1896 (L. Bruner).

567. *Junco hyemalis* (Linn.).—Slate-colored Junco. Abundant winter resident.

567*b*. *Junco hyemalis connectens* Coues. Shufeldt's Junco. Rarely over the state in winter. There are numerous records for the "Oregon Junco" in this state, but that form is confined to the Pacific Coast region, and most of them are doubtless referable to this variety. Without much doubt some are referable to the Montana Junco, *Junco montanus* Ridgw. The status of this group in Nebraska is in confusion, and certainly needs investigation and correction.

581. *Melospiza melodia* (Wils.).—Song Sparrow. Resident, uncommon in winter. Several winter records.

583. *Melospiza lincolnii* (Aud.).—Lincoln's Sparrow. One remained at Neligh, winter of 1898-99 (M. Cary).

584. *Melospiza georgiana* (Lath.).—Swamp Sparrow. Lincoln, December 15 (D. A. Haggard).

585. *Passerella iliaca* (Merrem). Fox Sparrow. Occasionally seen during warm winter weather (I. S. Trostler).

587. *Pipilo erythrophthalmus* (Linn.).—Towhee. Common in summer in eastern Nebraska, remaining late and rarely wintering. Lincoln, December 8, 1900 (J. S. Hunter).

588. *Pipilo maculatus arcticus* (Swains.).—Arctic Towhee. Over the state in fall and mild winters.

593. *Cardinalis cardinalis* (Linn.).—Cardinal. Common resident in southeast Nebraska.

618. *Ampelis garrulus* Linn.—Bohemian Waxwing. Irregular winter visitant. Beatrice, January 9, 1899; January 14, 1901.

619. *Ampelis cedrorum* (Vieill.).—Cedar Waxwing. Rare in winter. Beatrice, late in January, 1899. Lincoln, January 21, 1900 (R. H. Wolcott).

621. *Lanius borealis* Vieill. Northern Shrike. Common winter resident.

722. *Olbiorchilus hiemalis* (Vieill.).—Winter Wren. Uncommon in late fall, rare in winter. Dunbar, December 2, 1901 (M. A. Carriker, Jr.).

726. *Certhia familiaris americana* (Bonap.). -Brown Creeper. Common in winter.

726*b*. *Certhia familiaris montana* Ridgw.—Rocky Mountain Creeper. Extreme western part of state. Sioux Co., February 19, 1896 (L. Bruner).

727. *Sitta carolinensis* Lath.—White-bellied Nuthatch. Common resident, more in evidence in winter.

727*a*. *Sitta carolinensis aculeata* (Cass.). -Slender-billed Nuthatch. Sioux Co., December 12, 1895 (L. Bruner). Common westward.

728. *Sitta canadensis* Linn.—Red-bellied Nuthatch. Uncommon winter resident. Sioux Co., February 25, 26, 1896 (L. Skow).

731. *Parus bicolor* Linn.—Tufted Titmouse. A rare resident (I. S. Trostler). Taken in January (L. Bruner).

735. *Parus atricapillus* Linn.—Chickadee. Found throughout the year in extreme eastern Nebraska.

735*a*. *Parus atricapillus septentrionalis* (Harris).—Long-tailed Chickadee. Same as preceding, but commoner westward.

748. *Regulus satrapa* Licht.—Golden-crowned Kinglet. A winter resident (I. S. Trostler).

749. *Regulus calendula* (Linn.).—Ruby-crowned Kinglet. A winter resident (I. S. Trostler).

754. *Myadestes townsendii* (Aud.).—Townsend's Solitaire. Resident in western Nebraska, straggling east in winter. Several records.

761. *Merula migratoria* (Linn.). -American Robin. Not rare as a resident in mild winters. Beatrice, February 22, 1900. Lincoln, January 21, 1900 (R. H. Wolcott).

766. *Sialia sialis* (Linn.).—Bluebird. Resident, but rare in winter. January 22, 1901 (M. A. Carriker, Jr.).

A COMPARISON OF THE BIRD-LIFE FOUND IN THE SAND-HILL REGION OF HOLT COUNTY IN 1883-84 AND IN 1901

LAWRENCE BRUNER, LINCOLN

I do not know how many of you have ever gone over the sand-hill region of Nebraska, especially along the north and east edge where the water seems to have accumulated much more plentifully than in other portions of it. Be this as it may, it was my privilege along with several others to spend some time in 1883-84 in southern Holt County where we entered land under the tree-claim act. Leaving West Point we journeyed by team up the beautiful and fertile valley of the Elkhorn as far as Neligh, in Antelope County, where the United States land office for the district was located. Having arrived there, an inspection of the maps and records indicated that in the southwestern corner of Holt County, in the midst of the sand-hills, lay a low piece of land. The maps showed this tract of land to be located about ten

miles west of the east edge of the sand-hills and somewhere near the head-waters of the Cedar River. In this valley there seemed to be still remaining a few desirable quarter sections that might be available for entry as tree-claims. We accordingly proceeded on our way by wagon, driving across country some sixty or seventy miles and arrived after three days' very hard travel through water, slush, and sand. In passing through this intervening country we observed many birds, especially shore birds, although the ducks and other water fowl were not at all scarce. In fact we found them present in every little lakelet among the sand-hills and along their eastern border. Even the "blowouts" were at this time lakelets. The valleys were also full of water.

Upon reaching the sand-hills proper we first attempted to drive around all of these bodies of water, thinking that we would surely be mired should we attempt to drive into or through them. After awhile, however, we found that the bottoms of all lakes and other bodies of water were much more solid than some of the low ground that remained uncovered by the water. We accordingly drove right through many of these small bodies of water. Occasionally they proved to be pretty deep—much deeper than we had supposed them to be—and sometimes the water even entered the wagon-box. On frequent occasions a spectator might have had the pleasure of seeing several men standing ankle deep in water with a box of provisions or a bundle of clothing in arms while the driver in front was carefully guiding the now steady team in his endeavor to find the high places. The bag of flour was an object of special concern and would frequently be taken up on the shoulder by some member of the party as the water gradually deepened. After a day's travel through this alternation of sand, muck, and water we finally reached the head of the Cedar valley and at the same time the end of our journey. Here, too, the bird life was more abundant than at any of the places we had passed through in reaching this region. Such species as the Sand-hill Crane, American Bittern, Coot, Sora Rail, Sickle-billed Curlew, Bartram's Sandpiper, Wilson's Phalarope, Killdeer, Yellow-legs, Willet, Baird's and Least Sandpipers, and a number of other shore birds were met with in abundance. This was during the last few days of June and the early part of July.

We finally located upon land in this valley, built a sod stable, dug a well, and located camp as much as possible out of the way of the mosquitoes which at the time were present by the billions. This accomplished we began searching for the corners of our newly acquired land so as to locate the future groves and break fire lines. In the performance of this work it is needless to state that we found numbers of the nests of these birds. We also continued to run across young birds of various kinds. I remember that in a single day we found three broods of young sand-hill cranes. The birds, while they were only a couple of days old and covered with a reddish fluffy down, were already almost as large as a common domestic fowl. We took them

to our camp and in a few days had them very tame—so tame in fact that they would come to us to receive the grasshoppers which we captured and offered them.

One night while located in this camp we heard an unusual noise just back of the tent. It seemed to come from the interior of a small sand knoll lying between us and a small lake a few hundreds of yards away. I myself thought some one had located in the neighboring sand-hills where he had built for himself a home and had come down into the valley after nightfall in the neighborhood of our tent for some ulterior purpose. At any rate it seemed improbable that his mission to this part of the valley could be for water, knowing as I did that this was to be had almost anywhere. Just what the other members of the party thought remains untold to this day. But as to the afore said noise I must confess that it was akin to that most unearthly sound produced by an old wooden pump sucking wind. To say that my inquisitiveness didn't get the better of me would be untrue. I got up in spite of the mosquitoes and went out to see who this new neighbor of ours might be, believing as we did that the nearest settlement was a dozen or more miles away. But search as I would nothing could be seen in the dark. Early next morning in order to satisfy myself I went down towards the lake to obtain a clue as to who this man with the pump might be and where he came from. Strange as it may seem not even a shadow of a clue was to be found of our midnight visitor, and, in the language of the novelist, the mystery deepened. Next day, however, the noise was repeated while the sun shone brightly. The mystery had so deepened by this time that solved it must be. A visit to the locality was at once decided upon, but lo! I could see nothing that looked unusual. Only a lone bittern was visible upon the near shore of the lake, and he was apparently unconcerned as well as undisturbed by the noise of a few moments before. But while I stood there endeavoring to solve the greatest puzzle of my life this lone bird changed his listless attitude and commenced to perform. He felt like singing and he began to sing, and the song that he sang was that of the old wooden pump sucking wind. The mystery was solved and I slunk back to camp only to keep quiet about our new neighbor. Moral: Perseverance will solve the deepest of mysteries. We found no bitterns' nests this year although there must have been hundreds of them in the region judging from the nightly revelry at the lakeside just behind the little hill.

A few belated ducks' nests and some of other birds were taken. The next year we returned to the locality somewhat earlier to do our plowing and tree-planting, and left during the latter part of May or early in June. During this period, however, birds' eggs of various kinds were so abundant that we had all we could eat in camp. In fact, bye and bye, they became so plentiful that we tired of eggs as a diet; and this, too, only from the nests that were run across simply in

tree-planting and plowing furrows for fire breaks. Among the eggs taken were those of the Prairie Chicken, Sharp-tailed Grouse, Coot, Blue-winged Teal, Gadwall, Shoveller, Mallard, American Bittern, Black Tern, Forster's Tern, and a number of others.

We also noticed that there were present in the region a number of hawks, as the Marsh Hawk, American Rough-leg, Swainson's, and one or two others, some or all of which surely nested in the near vicinity. The Burrowing and Short-eared Owls were likewise of common occurrence in the immediate neighborhood, while both the Nighthawk and Mourning Dove were observed daily before we left. The latter did not use trees or bushes for the purpose but nested on the bare ground instead. Sometimes, however, we found that they selected weed-like herbs in which to place these structures, as for example, the weed called "Shoestring." In addition to the species already named we found such others as the Western Meadow Lark, Yellow-headed Blackbird, Red-winged Blackbird, Cowbird, Bobolink, Shore Lark, Grasshopper Sparrow, Lark Sparrow, Lark Bunting, Dickcissel, and several other sparrows, present in large numbers and nesting. It is needless to say that we were ever and anon running across their nests. When we started out across country for a walk it was no uncommon occurrence during a two or three miles' tramp to find a dozen or even as many as two dozen nests. At this time it was noticed that the prairie chickens were exceedingly numerous. In the morning we would hear them "booming" in every direction. Especially was this the case in the little valley where we were located. In fact this valley seemed to be their headquarters. They would come down from the surrounding sand hills in every direction, and sometimes there would be forty or fifty within sight at once, with the feathers on their necks up, and at the same time uttering their booming song which could be heard for miles. The Sharp-tailed Grouse was fairly common also. The black terns and grebes were also quite numerous. In the little lake already referred to in connection with "the mystery" there were perhaps a dozen nests of each of these last named birds; and I do not know how many rail's nests might have been found by walking through a little patch of rushes in the immediate vicinity. The Long-billed Marsh Wren was also very common as attested by their globular nests attached to the fringe of bullrushes growing about the various lakes. Most of the birds were abundant for several years later before their withdrawal or disappearance was especially noted.

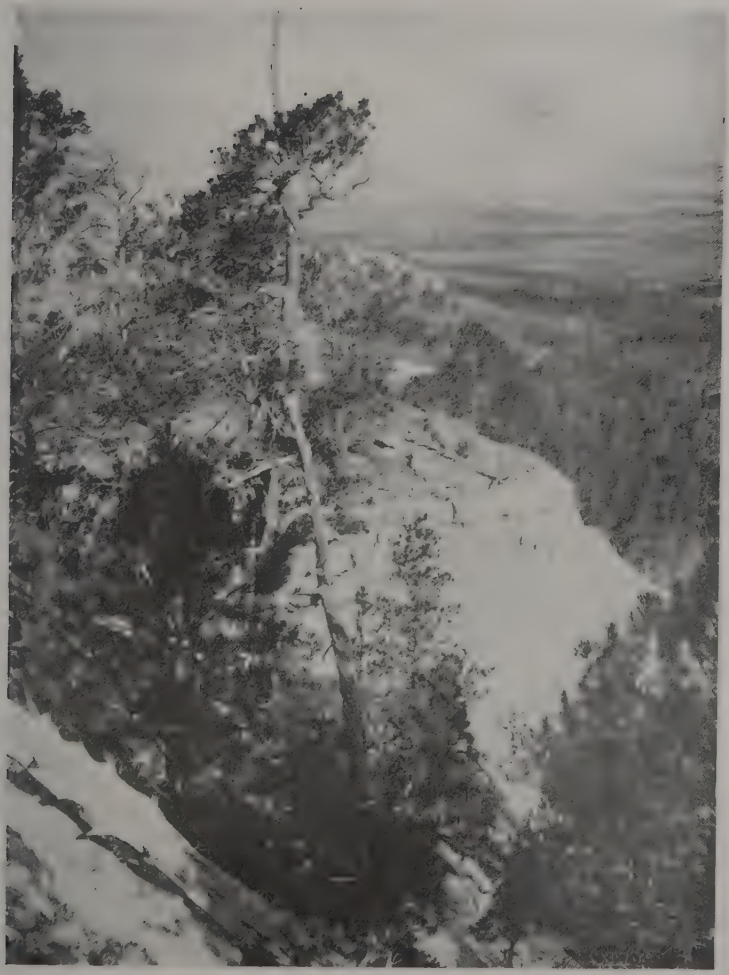
I might write of the various songs and cries uttered by this host of birds which was present both day and night. Some of these sounds were uttered in fear, while others were the overflow of happiness, and still others those of warning or it may be were for the purpose of drawing together the members of separated families. The Meadow lark was, of course, exceedingly melodious at that time of the year, and, being so numerous, the songs could be heard in every direction. Then

there was that of the Bobolink, of which there were hundreds in the valley and these were continually in the air singing, as were also the lark buntings; but time is short and precious.

The above was the condition of bird life in that region seventeen, or even sixteen, years ago. Last summer, as luck would have it, I had the opportunity to spend a few weeks at just about the same time of year in the region that I had visited in the early eighties, and had the opportunity to mark and note the difference in the bird life during the two periods. Starting from a little town not far from Neligh and driving over practically the same ground as on the former occasion, I saw three pairs of the Bartram's Sandpiper, no prairie chickens and no sharp-tailed grouse. Two or three little blue-winged teal and a few sparrows were also noted, but these were all that remained of the former formidable list of these busy-winged, happy creatures in a drive of a day and a half, while covering a stretch of sixty miles of territory. On arriving at the ranch or tree claim referred to above we found a slight improvement in affairs. A few Bartram's sandpipers still remained, as did also several pairs of the black terns. The Meadow-lark was fairly abundant, but not nearly so numerous as it had been on the former occasion. During this latter trip there were seen three or four pairs of Wilson's phalaropes, some yellow-legs, and one other sandpiper besides the Bartram's. Only the Cowbird, Dickcissel, Lark Sparrow, and Lark Bunting seemed about as numerous as formerly. Then, too, there were noticed a few kinds of other birds that have been brought into the country on account of the attractions offered by the trees which now grow there. Formerly we had no trees, perhaps within twenty miles, to invite even so common a bird as the Brown Thrasher. In noting these new birds for the region we had to record the Bronzed Grackle, Flicker, Red-headed Woodpecker, Yellow-billed Cuckoo, Catbird, Brown Thrasher, Phoebe, Yellow Warbler, a vireo, Blue-bird, Blue Jay, Barn Swallow, Goldfinch, and Lazuli Bunting. All these had come into the region and established themselves in the artificial groves. The Quail, or Bob-white, I was pleased to know had penetrated to the region and found a home in the groves where they are protected. I also visited the region a little later this last summer than I had on any former occasion. During this last visit I found birds of migration such as Say's Phoebe, Arkansas Kingbird, Purple Martin, Piñon Jay, etc. These also in passing south to the Platte River make this point a resting place for a few days. The trees which they find here on these tree claims seem to them as an oasis in the desert does to the dusty and sand-begrimed traveler in the Sahara. They are isolated tracts of timber and the closest neighbors a number of miles away. These groves of trees, as yet small, seem to invite the passing birds and make the locality a magnificent place in which to study bird life.

It is hoped that this brief and hurriedly prepared paper shows to

PLATE V



PINE RIDGE, LOOKING OUT INTO HAT CREEK VALLEY
Bad Lands in the distance.

a limited extent at least what an influence man has on bird life, and perhaps also animal life in a general way, over the country. It shows on the one side what a man with a gun can do in a very short time in the way of destroying and removing God's creatures from the face of the earth,—creatures which have been created for the special purpose of equalizing things and making life worth living. It also shows, on the other hand, what a little labor in the way of tree-planting will do towards attracting and providing homes for others.

SOME GENERAL REMARKS UPON THE DISTRIBUTION OF LIFE IN NORTHWEST NEBRASKA

MERRITT CARY, NELIGH

Northwest Nebraska, as the term is applied in the present paper, refers to the region north of the F. E. & M. V. R. R. from Crawford to Van Tassel Ranch, and west of the B. & M. R. R. from Crawford to the Nebraska-South Dakota line, near Ardmore, S. D. Within these confines are embraced the highest and most rugged portions of Pine Ridge, practically all of the Hat Creek Basin, and a much smaller region lying on either side of White River,—a total area of some 700 square miles.

GENERAL TOPOGRAPHY

In the varied configuration and highly diversified character of the region as a whole, as well as in the dearth of vegetation of one section contrasted with the luxuriance of another, and in the great variation in the amount of moisture,—as a matter of fact, in all those factors which have a direct bearing upon the distribution of animal life,—northwest Nebraska presents extremes which certainly cannot be equaled in any other section of our own state, and which, I dare say, are seldom met with in any other portion of the country having corresponding altitudes. The region presents two strongly contrasted types of country, each having numbers of bird, mammal, and plant forms peculiar to itself. These will be treated separately under the headings "Pine Ridge" and "Hat Creek Basin."

PINE RIDGE. Pine Ridge is, as its name signifies, a high ridge of land supporting a growth of *Pinus ponderosa*. It is highest and widest at its western end where it is a plateau with an altitude of 5300 feet, forming the watershed or divide between the Running Water on the south and Hat Creek on the north. The northern escarpment of Pine Ridge enters Nebraska from Wyoming at Squaw Butte, a point some fifteen miles south of the South Dakota line, and extends, with a general southeast trend, to Crawford.* Its southern slope is practically

* From Crawford the general course of Pine Ridge is to the northeast, entering South Dakota from Sheridan County. The eastern portion of the ridge is much lower, with a corresponding decrease in the amount of pine timber.

parallel with the course of the Running Water. Starting near Andrews and extending down to Crawford the White River Cañon divides the ridge into two watersheds, the north one being between White River and Hat Creek, and the south one between White River and the Running Water.

On the north and northeast, Pine Ridge slopes abruptly through numerous deeply cleft and well wooded cañons, into the Hat Creek Basin, some 1300 feet lower. The pine growth in the western portion is confined to the cañons on the northern escarpment, with a few scattering trees in the cañons along White and Running Water rivers; but from Fort Robinson east a more or less scattering growth covers the entire table of the ridge.

We have here presented two well-marked topographical subdivisions which for the sake of convenience I shall call the "Plateau Region" and "Wooded Cañon Region." As will be subsequently shown, each of these respective subdivisions might well be considered as a distinct faunal area, owing to its possession or non-possession of a great many species peculiar to the other.

Plateau Region. Enough has already been said to define the boundaries of this region fairly well. Suffice it to say that it forms the top or table of Pine Ridge in its western portion and varies in altitude from 5300 feet near the head of Warbonnet Cañon to about 4200 near Fort Robinson. In appearance it is a slightly undulating plain, supporting in ordinary years a rank growth of range grasses, "nigger-wool" predominating.

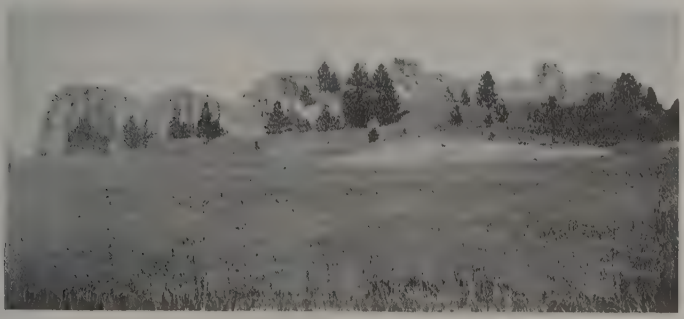
In the higher portions of this plateau, particularly in the vicinity of Squaw Butte and at the head of Jim Creek, there are frequent outcroppings of the Arikaree formation in the form of bare chalk buttes from five to fifty feet in height. In these buttes are found the peculiar formations commonly called "Devil's Corkscrews,"—the Diamonelix of geologists—concerning the composition of which there has been so much controversy in recent years.

No trees or shrubs of any kind whatever grow upon this high grassy expanse, and in the remarkably clear air which prevails at this altitude one can plainly see objects at a great distance. Away to the southwest the top of Laramie Peak shows up clearly above the bold outlines of the Rawhide Buttes, while, shifting our gaze to the northward, the Black Hills are veiled in the purple of the distance. Mirages are not uncommon in July.

Lupinus plattensis, *Townsendia grandiflora*, several species of *Psoralea*, *Astragalus hypoglottis* and *Sedum stenopetalum** are among the characteristic plants of the plateau.

A number of birds find a congenial summer home here, though few in number compared with those found in the wooded creeks and

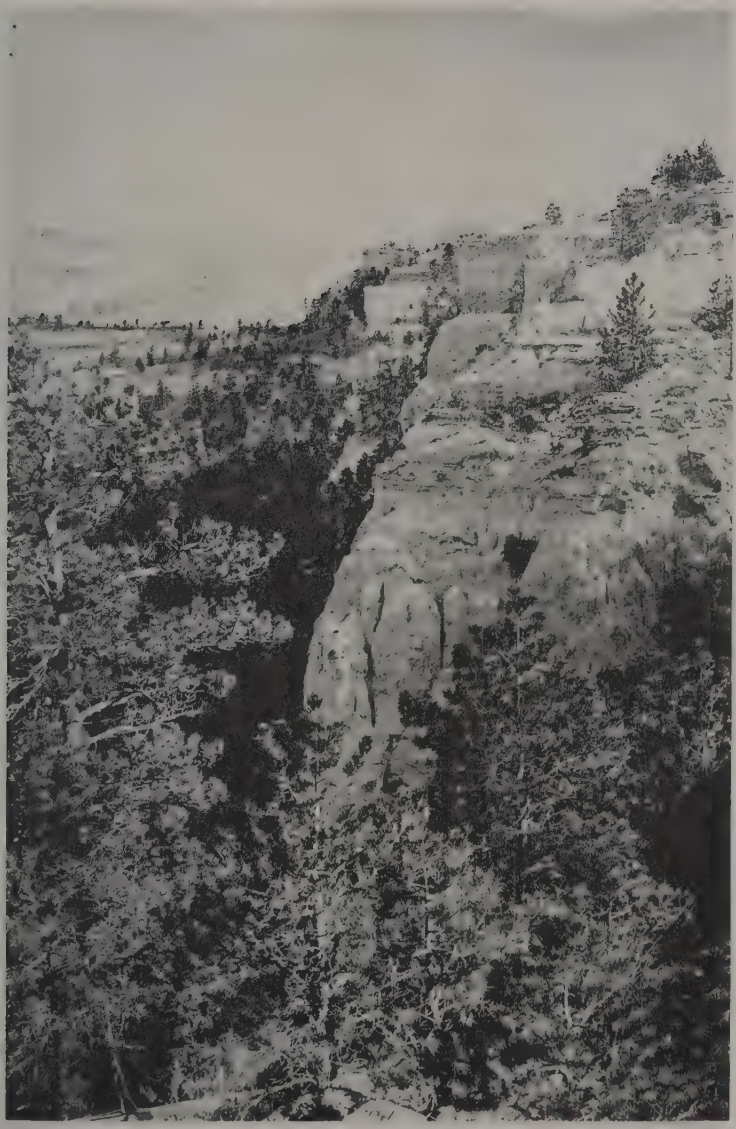
*It is interesting to note that a butterfly, *Parnassius smintheus*, usually confined to the boreal fauna of high mountains, and whose larva feeds on *Sedum*, flies abundantly on the plateau in June.



PINE RIDGE; VIEWS ON THE PLATEAU

A small "core" of rock in a "blow-out" above, the large buttes at the head of Jim Creek Canyon below.

PLATE VII



PINE RIDGE; LOOKING BACK INTO A CANYON ON THE NORTH ESCARPMENT

cañons to the north. Some of the breeding birds are: Bartramian Sandpiper, Long-billed Curlew, Ferruginous Rough-legged Hawk, Western Nighthawk, McCown's Longspur, Western Vesper and Grasshopper Sparrows, Desert Horned Lark, Western Meadow-lark, and Rock Wren, the last nesting in holes in the chalk buttes.

While there are no mammals restricted to this table-land, yet it is characterized by the absence of a number of prairie forms which occur in the Hat Creek Basin at a much lower level, among them being *Lepus melanotis*, *Cynomys ludovicianus*, *Perodipus richardsoni*, *Perognathus h. paradoxus*, *P. flavescens*(?), and *Onychomys leucogaster*. The omnipresent Coyote (*Canis nebrascensis*) is abundant here as elsewhere. An occasional antelope is seen, but the species is fast becoming rare. A single species of rabbit (*Lepus baileyi*) is found around the buttes, and makes its home in crevices of the rock. Badgers and a spermophile (*Spermophilus t. pallidus*) are common. A white-footed mouse (*Peromyscus t. nebrascensis*) occurs sparingly in rocky places, while Hayden's Vole (*Microtus a. haydeni*) has its small runways ramifying through the matted grass.

Reptiles are poorly represented. Blue racers, bull-snakes, and the Prairie Rattlesnake, together with a species of horned toad (*Phrynosoma douglassi*) were noted.

Wooded Cañon Region.—The northern escarpment of Pine Ridge is a region of extremely rugged and, in many cases, perpendicularly walled cañons which vary in length from one to three miles, the majority of them giving off numerous side cañons also of varying lengths. A few cañons, however, descend from the plateau to Hat Creek Basin between unbroken walls, these being shortest and having a much more abrupt descent. Cold streams, fed by numerous springs along the first mile or so of their course, flow through the larger cañons, and these, in addition to the heavy tree growth and north exposure, cause a cooler and moister atmosphere than in surrounding regions, thus accounting for the presence of a great many northern plants and breeding birds generally found in this latitude at a much greater altitude.

The prevailing tree of the region is the Yellow Pine (*Pinus ponderosa*) which clothes the cañon sides and frequently forms a fringe around the upper walls. A sparse growth of Red Cedar (*Juniperus virginianus*) is sometimes mixed in with the pine near the rim rock, while near the heads of streams in the deepest cañons thickets of Quaking Aspen and Poplars (*Populus tremuloides* and *P. balsamifera*) are found. Among other trees and shrubs in the cañons are the Juniper (*Juniperus communis*), the Creeping Barberry (*Berberis aquifolium*), the Mountain Maple (*Acer glabrum*), the Small Service-berry (*Amelanchier alnifolia*), the Hairy Dogwood (*Cornus amomum*), and the Black Birch (*Betula occidentalis*). Smaller plants much in evidence are *Astragalus hypoglottis*, *Symphoricarpus pauciflorus*, *Galium boreale*, *Viola canadensis*, *Limnorchis hyperborea*, *Penstemon glaber*, and *Campanula rotundifolia*. The majority of trees and plants just listed are characteristic of the Transition Zone throughout the Rocky

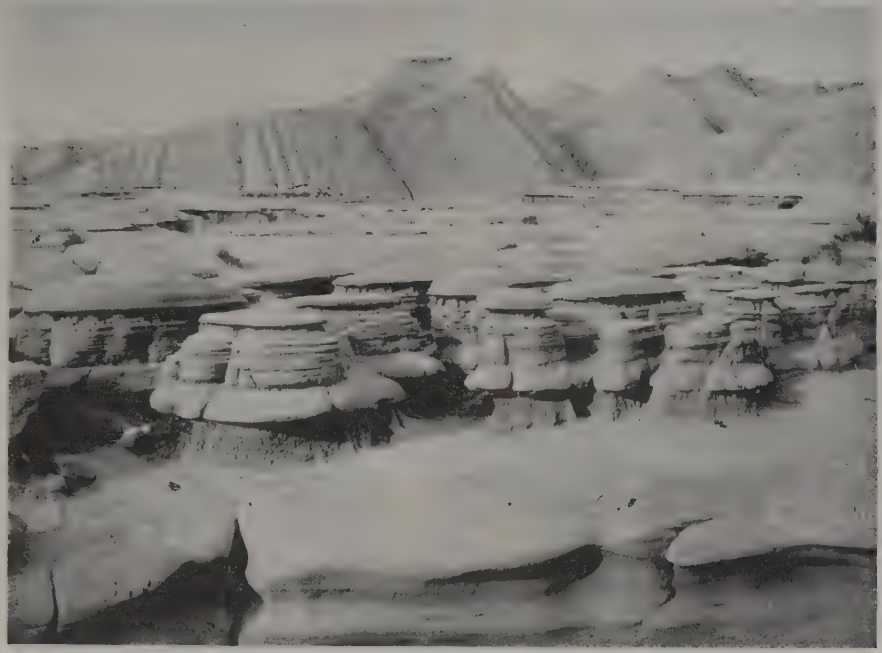
Mountains, their nearest neighbors being in the Black Hills, over 100 miles to the north, from which the ridge is separated by the broad Hat Creek Basin. In this connection it is interesting to note that a few species of the Canadian flora are also found in the deepest and darkest cañons.

Among the birds we find an exact parallel. The breeding of such species as Townsend's Solitaire, the White-winged Junco, and the Mountain Bluebird clearly points to the fact that the environment, if not strictly Canadian, is certainly favorable for Canadian breeders. This region fairly teems with bird life, both as to number of species represented and number of individuals. Among breeding birds are the Louisiana Tanager, Audubon's Warbler, Lewis's Woodpecker, the Sharp-shinned Hawk, the Oven-bird, Krider's Hawk, the Plumbeous Vireo, the Western Warbling Vireo, Cabanis's Woodpecker, the Slender-billed Nuthatch, the Chipping Sparrow, the Prairie Falcon, and the Olive-backed Thrush (?).

The number of mammals found in the cañons is much smaller than might naturally be expected. The White-tailed Deer, the Yellow-haired Porcupine, the Long-tailed Weasel (?), a chipmunk (*Tamias minimus*), a wood rat (*Neotoma rupicola*), a white-footed mouse (*Peromyscus t. subarcticus*?), and a mole (*Scalops a. machrinus*), are characteristic species.

Hat Creek Basin.—This is the name applied to the extensive valley or gap which lies between Pine Ridge and the Black Hills. It is fully 100 miles wide and embraces portions of Wyoming, Nebraska, and South Dakota, varying in altitude from nearly 4000 feet on Indian Creek to 3600 in its eastern portion. The chief watercourse, Hat Creek, which flows through the center of the region in a general northeasterly direction, is fed by numerous small streams having their sources in the cañons on the north slope of Pine Ridge. From the Wyoming line eastward the principal ones are, successively, Indian, Antelope, Squaw, Jim, Warbonnet, Monroe, Prairie Dog, Bad Land, and Sowbelly creeks. The banks are invariably clothed with a heavy growth of deciduous trees for a mile or more out into the valley but beyond this are bare, or merely support a sparse growth of cottonwoods, while the water becomes alkaline. Since it is not within the province of the present paper to go beyond the boundaries of Nebraska I shall confine myself to that portion of the basin which lies between Pine Ridge and the South Dakota line, and between the B. & M. R. R. and the Wyoming line, although exactly similar conditions obtain in southwestern South Dakota and eastern Wyoming.

In its eastern portion, east of a line drawn north from the mouth of Monroe Cañon, there are extensive areas of bad lands and naked buttes, marked by a great scarcity of vegetation of all kinds. Throughout this bad lands region the water is strongly alkaline and the streams usually go dry after July 1. The western portion of the basin is an undulating expanse of cactus plains and sage brush, the latter being confined to



"TOADSTOOL PARK" IN THE HAT CREEK BAD LANDS
Each "toadstool" is ten or twelve feet high.

the vicinity of streams, where it forms a fringe from a half mile to two miles in breadth. In making a survey of the bad lands it soon became evident that the region was possessed of forms peculiar to itself, and entirely distinct from those found in the sage brush country. Owing to this fact I shall make two faunal subdivisions of the Hat Creek Basin.

Bad Lands Area.—This barren alkaline waste, the "mauvaises terres" of the early French voyageurs, supports vegetation only along the partially dry watercourses. Back from these there is scarcely a vestige of plant growth. In such an unforbidding region one would scarcely expect to find much evidence of bird and mammal life*; yet, as we shall see later, several species of birds find here a congenial summer home, and a few mammals live in the roughest portions among the rocks.

Cottonwoods (*Populus deltoides*) form a narrow fringe along portions of Bad Land and Prairie Dog creeks, and rarely there is a thicket of Buffalo Berry (*Lepargyrea argentata*). At the heads of several bad-land draws a heavy growth of *Rhus trilobata* was noted. The Sand Cherry (*Prunus pumila*), *Rosa woodsii*, and *Aragallus lambertii* grow in gravelly soil, while in damp places such leguminous species as *Amorpha fruticosa* and *Astragalus multiflorus* grow in rank profusion.

The breeding birds of the Bad Lands Area are the Western Lark Sparrow, the Arkansas Flycatcher, the Kingbird, the Red-winged Blackbird, the White-rumped Shrike, Bullock's Oriole, Say's Phoebe, the Killdeer, and McGillivray's Warbler (?).

The following mammals occur sparingly: *Tamias minimus*, *Lepus* sp. (probably *baileyi*), *Mephitis hudsonica*, *Vulpes velox*, *Canis nebrascensis*. Two species of toads were collected here and nowhere else. A horned toad (*Phrynosoma douglassi*) was common.

Sage Brush Plains Region.—The western subdivision of the Hat Creek Basin covers an area of some 160 square miles and comprises the valleys of Indian, Antelope, Squaw, Jim, and Warbonnet creeks, together with the low connecting divides. The latter support a rather dense growth of cactus as well.

As before stated, the characteristic plants are the Sage Brush (*Artemisia tridentata*), the Prickly Pear (*Opuntia polyacantha*), and two species of *Cactus*. In addition we find growing here *Yucca* sp., *Rosa arkansana*, *Ribes floridum*, *Hymenopappus filifolius*, *Argemone intermedia*, *Eriogonum annuum*, *Lepargyrea argentea*, *Artemisia cana*, *Gutierrzia euthamiæ*, *Sarcobatus vermiculatus*, and *Amorpha canescens*. Along streams in the southern portion of the region such deciduous trees as the Box-elder (*Acer negundo*), the Elm (*Ulmus americana*), the Black Willow (*Salix nigra*), and the Black Birch (*Betula occidentalis*), are found.

Bird life is abundant and varied. The following were found to be

*In prehistoric times it was far different. Then the region fairly teemed with animal life, as evidenced by the numerous remains of the monster *Titanotherium*, the *Oreodon* and such peculiar beasts as the Saber-toothed Cat, the Three-toed Horse, etc.

the most characteristic breeders: Lark Bunting, Western Grasshopper Sparrow, Western Vesper Sparrow, Brewer's Sparrow, Lazuli Finch, Western Meadow-lark, Bullock's Oriole, Bronzed Grackle, Brewer's Blackbird, Black-headed Grosbeak, Prairie Sharp-tailed Grouse, Sage Hen, Long-tailed Chat, Yellow Warbler, Western Yellow-throat.

Some of the larger mammals are the Antelope, the Badger, a jack rabbit (*Lepus melanotis*), a cottontail (*Lepus baileyi*), the Coyote (*Canis nebrascensis*), the Skunk (*Mephitis hudsonica*) and a bob-cat (*Lynx rufus*?). Smaller species noted were *Cynomys ludovicianus*, *Perodipus richardsoni*, *Onychomys leucogaster*, *Perognathus flavescens*(?), *P. hispidus paradoxus*, *Microtus modestus*, *Spermophilus t. pallidus*, *Peromyscus t. nebrascensis*, *Geomys lutescens*, *Thomomys* sp.

LIFE ZONES.

From what has already been said concerning the occurrence of various semi-boreal, as well as strictly austral, forms of life in northwest Nebraska it is obvious that we have here at least two well-defined life zones, each characterized by the possession of species of plants, birds, and mammals not found in the other. To be more exact, the two subdivisions of the Hat Creek Basin which I have designated as the "Sage Brush Plains Region" and the "Bad Lands Area," both agree in possessing truly arid land or desert species, able to withstand great extremes of drouth and heat; while distinctive forms are possessed by each subdivision owing to such minor factors as variation in the amount of plant growth, soil differences, and surface configuration. Thus both the above subdivisions fall naturally under the arid portion of the Upper Austral Life Zone, defined by Merriam as the Upper Sonoran Faunal Area.*

Again, the presence of such semi-boreal species as have already been listed from the wooded cañons points to at least a life zone having boreal affinities. And when we take into account the presence of a number of southern species, or species of southern extraction, in the same region it clearly indicates a zonal area with mixed affinities, partly boreal and partly austral in its composition. To this zone Dr. Merriam, who at the present time is unquestionably the authority on geographic distribution of animal life in North America, applies the name "Transition" because of its intermediate position. Inasmuch as the same authority has divided the Transition Zone of North America into three geographic areas characterized chiefly by the relative amount of humidity, the wooded cañon region together with the adjacent plateau would come under the Arid Transition.

Now that the four different regions of northwest Nebraska have resolved themselves into two fairly well-defined life zones the next step will be to group, as far as possible, the various plants, mammals, and birds under their respective zones.

* Life Zones and Crop Zones of U. S., 1898, p. 36.

PLATE IX

A BEAVER POND ON BIEHLE'S CREEK IN HAT CREEK VALLEY

[In this connection it should be stated that these conclusions in regard to life zones are provisional and subject to correction, since they are based upon observations made by the writer only during the last two weeks in May, 1900, and in June and July, 1901. During the season of 1901 I was in the region in company with Mr. M. A. Carriker, Jr., and my notes for this period are supplemented by his own.]

MAMMALS.—Restricted to the Upper Sonoran: *Microtus modestus*, *Perognathus flavescens*(?), *Perognathus hispidus paradoxus*, *Perodipus richardsoni*, *Onychomys leucogaster*, *Spermophilus spilosoma obsoletus*, *Geomys lutescens*, *Lepus melanotis*, *Cynomys ludovicianus*, *Vulpes velox*.

Restricted to the Transition: *Peromyscus texanus subarcticus*, *Neotoma rupicola*, *Blarina* sp., *Castor canadensis*, *Putorius longicaudus*, *Erethizon epixanthus*, *Odocoileus virginianus macrourus*, *Odocoileus hemionus*, *Myotis evotis*, *Myotis californicus ciliolabrum*.

Common to the Upper Sonoran and Transition: *Microtus austerus haydeni*, *Peromyscus texanus nebrascensis*, *Scalops aquaticus machrinus*, *Spermophilus 13-lineatus pallidus*, *Tamias minimus*, *Thomomys* sp., *Fiber zibethicus*, *Lutreola vison* (following up streams from Upper Sonoran into Transition), *Procyon lotor*, *Lepus baileyi*, *Lynx rufus*(?), *Canis nebrascensis*, *Mephitis hudsonica*, *Taxidea taxus*, *Antilocapra americana*, *Vespertilo fuscus*.

PLANTS.—Restricted to the Upper Sonoran: *Populus deltoides*, *Eriogonum annuum*, *Atriplex nuttallii*, *Eurotia lanata*, *Sarcobatus vermiculatus*, *Argemone intermedia*, *Ribes floridum*, *Rosa arkansana*, *Rosa woodsii*, *Prunus pumila*, *Amorpha fruticosa*, *Amorpha canescens*, *Astragalus multiflorus*, *Aragallus lambertii*, *Rhus glabra*, *Cactus* (two species), *Opuntia polyacantha*, *Lepargyrea argentea*, *Gutierrezia euthamiæ*, *Hymenopappus filifolius*, *Artemisia filifolia*, *Artemisia tridentata* (narrow tongues of sage brush extend well up into the Transition on such of the north slopes of Pine Ridge as are open), *Artemisia cana*.

Restricted to the Transition: *Pinus ponderosa*, *Juniperus communis*, *Limnorchis hyperborea*, *Corallorhiza multiflora*, *Populus balsamifera*, *Populus tremuloides*, *Ostrya virginiana*, *Berberis aquifolium*, *Sedum stenopetalum*, *Ribes cereum*, *Amelanchier alnifolia*, *Astragalus hypoglottis*, *Acer glabrum*, *Viola canadensis*, *Cornus amomum*, *Galium boreale*, *Symphoricarpus pauciflorus*, *Campanula rotundifolia*.

Common to the Upper Sonoran and Transition: *Juniperus virginiana*, *Salix nigra*, *Betula occidentalis*, *Ulmus americana*, *Clematis ligusticifolia*, *Ribes oxyacanthoides*, *Ribes aureum*, *Prunus demissa*, *Lupinus plattensis*, *Rhus trilobata*, *Rhus radicans*, *Acer negundo*, *Vitis cordifolia*, *Parthenocissus quinquefolia*, *Cornus stolonifera*, *Symphoricarpus occidentalis*, *Townsendia grandiflora*.

The above lists are composed mainly of shrubs and woody perennials, as these are of much the greater value in determining zonal limitations. Nomenclature according to Britton.

BIRDS

Species restricted to Upper Sonoran

140. *Querquedula discors* (Linn.).—Blue-winged Teal. Small pond on Monroe Creek.

142. *Spatula clypeata* (Linn.).—Shoveller. In company with the preceding. These ducks probably bred in the vicinity.

190. *Botaurus lentiginosus* (Montag.). -American Bittern. The Bittern was seen but once—on the S-E* ranch.

273. *Aegialitis vocifera* (Linn.).—Killdeer. A common breeder in the bad lands.

308*b*. *Pedioecetes phasianellus campestris* Ridgw.—Prairie Sharp-tailed Grouse. Was found breeding in alfalfa fields along Monroe and Jim Creeks.

309. *Centrocercus urophasianus* (Bonap.).—Sage Grouse. A few pairs of the Sage Grouse were nesting in the sage brush along Antelope and Indian creeks. Mr. Carriker shot young birds in the middle of July.

331. *Circus hudsonius* (Linn.).—Marsh Hawk. Dr. Wolcott secured a set of eggs of the Marsh Hawk in a swampy tract in the bad lands early in June.

378. *Speotyto cunicularia hypogaea* (Bonap.).—Burrowing Owl. Often seen around dog towns where they breed.

388. *Coccyzus erythrophthalmus* (Wils.).—Black-billed Cuckoo. Several seen along the creeks in June and July.

444. *Tyrannus tyrannus* (Linn.). Kingbird. Often had its nest in the same tree with Arkansas Flycatcher, but was not nearly so abundant.

447. *Tyrannus verticalis* Say.—Arkansas Flycatcher. An abundant breeder in the cottonwoods along the bad lands streams, the middle of June being the height of their breeding season. In a distance of two miles along Bad Land Creek there must have been fully a hundred pairs of these birds breeding in 1901.

488. *Corvus americanus* (Aud.).—Crow. A crow was seen at Crawford, Neb., May 25, 1901.

495. *Molothrus ater* (Bodd.).—Cowbird. A common bird in the valley.

498. *Agelaius phoeniceus* (Linn.).—Red-winged Blackbird. Breeding abundantly in a bad lands marsh May 28, the nests nearly all containing fresh sets.

508. *Icterus bullocki* (Swains.).—Bullock's Oriole. A set of eggs was taken on Bad Land Creek. June 16. Other birds were seen on Indian Creek a few days later.

510. *Scolecophagus cyanocephalus* (Wagl.).—Brewer's Blackbird. Numbers of Brewer's blackbirds, both young and adults, were seen on Indian Creek, June 18-20.

511*b*. *Quiscalus quiscula æneus* (Ridgw.).—Bronzed Grackle. Frequently seen in the Basin.

552*a*. *Chondestes grammacus strigatus* (Swains.). -Western Lark Sparrow. Common breeder in the bad lands, where a number of nests were found.

562. *Spizella breweri* Cass. -Brewer's Sparrow. Mr. Carriker found several pairs of Brewer's sparrows breeding on Indian Creek. The nests were in bushes of the Greasewood (*Sarcobatus vermiculatus*).

*The brand used at the ranch; pronounced S-bar-E.

599. *Cyanospiza amœna* (Say).—Lazuli Bunting. Found nesting in thickets of *Prunus demissa* late in July. Seen also in the Transition but did not breed there.

604. *Spiza americana* (Gmel.).—Dickcissel. Heard several times in alfalfa fields.

605. *Calamospiza melanocorys* (Stejn.)—Lark Bunting. The most abundant summer resident of the Hat Creek Basin. Nesting was at its height on June 18, when out of a dozen or more nests examined all but one were hidden beneath a sage bush. The exception was a nest which the birds had built right in the middle of a thick bunch of cactus (*Opuntia polyacantha*). Out of seven nests examined the male bird was flushed from five.

616. *Riparia riparia* (Linn.).—Bank Swallow. Along White River, Crawford, May 25.

652. *Dendroica æstiva* (Gmel.).—Yellow Warbler. Common breeder in the Basin.

703. *Mimus polyglottos* (Linn.).—Mockingbird. Mr. Carriker shot both young and adult mockingbirds on Antelope Creek in the middle of July, and several adults were noted in other places during the summer.

704. *Galeoscoptes carolinensis* (Linn.).—Catbird. A common bird along lower Monroe Creek, where they doubtless breed.

755. *Hylocichla mustelinus* (Gmel.).—Wood Thrush. A few were seen on Biehle's Creek.

The following species were seen at Crawford, July 28, but were evidently migrants: Baird's Sandpiper (*Tringa bairdii*)?, Least Sandpiper (*Tringa minutilla*), Solitary Sandpiper (*Helodromas solitarius*), Yellow-legs (*Totanus flavipes*).

Species restricted to Transition

332. *Accipter velox* (Wils.).—Sharp-shinned Hawk. Breeding in the west branch of Warbonnet and in Monroe cañons.

333. *Accipiter cooperii* (Bonap.).—Cooper's Hawk. A pair nested in Warbonnet Cañon late in June.

337*a*. *Buteo borealis kriderii* Hoopes.—Krider's Red-tail. During the last of May, 1900, a pair of Krider's Red-tail were found nesting on a ledge upon the face of a high cliff in the west branch of Monroe Cañon, and in 1901 a pair had a nest in a similar situation in the third cañon west of Monroe. Found also in Upper Sonoran, but breeding restricted to Transition.

355. *Falco mexicanus* Schleg.—Prairie Falcon. Nesting on a ledge of rock near the top of Saddle Butte at Crawford, and also on one of the east cliffs of Warbonnet Cañon.

390. *Ceryle alcyon* (Linn.).—Kingfisher. Seen at a beaver pond in Sowbelly Cañon. Breeding in Transition questioned. Probably accidental.

393*d*. *Dryobates villosus hyloscopus* (Cab.).—Cabanis's Woodpecker. Breeding in willow stubs; Warbonnet, Monroe, and Dead Man's cañons.

394*b*. *Dryobates pubescens homorus* (Cab.).—Bachelder's Woodpecker. Same nesting habits as preceding, but not so common.

408. *Melanerpes torquatus* (Wils.).—Lewis's Woodpecker. Nesting throughout the range of *Pinus ponderosa*—a characteristic bird of the cañon sides.

418. *Phalaenoptilus nuttallii* (Aud.). Poor-will. Nesting at the base of the rim rock—four or five pairs to the cañon.

425. *Acronautes melanoleucus* (Baird).—White-throated Swift. An abundant breeder in cracks and crevices of the cliffs.

459. *Contopus borealis* (Swains.).—Olive-sided Flycatcher. I secured a specimen of the Olive-sided Flycatcher in the second cañon east of Warbonnet on the 14th of June. Breeding questioned.

475. *Pica pica hudsonica* (Sab.).—American Magpie. A common breeder in the cañon region.

492. *Cyanocephalus cyanocephalus* (Wied).—Piñon Jay. Both adults and young abundant, but the only breeding evidence secured was a couple of old nests which Mr. Carriker found at the head of Gerlach's Cañon.

521. *Loxia curvirostra minor* (Brehm).—American Crossbill. Common in the pines in June, but in July feeding on *Helianthus* seeds. Breeding doubtful.

533. *Spinus pinus* (Wils.)—Pine Siskin. Seen at intervals during July in the pines. Breeding questioned.

560. *Spizella socialis* (Wils.).—Chipping Sparrow. An abundant summer resident, nesting in the small pines and cedars.

567. *Junco aikeni* Ridgw.—White-winged Junco. The breeding of the White-winged Junco in northwest Nebraska was definitely established in 1901. Mr. Carriker found a nest containing young about the first of July, and a little later I saw young birds in the west branch of Warbonnet Cañon—fully two miles west of the first nest found. Old birds were frequently seen in the coolest and dampest portions of the cañons among the juniper thickets and quaking aspens.

581. *Melospiza melodia* (Wils.).—Song Sparrow. In a cañon along Pine Ridge between Crawford and Fort Robinson, on May 24, Prof. Bruner and the writer flushed a Song Sparrow from some *Symphoricarpus* bushes, which acted in a peculiar manner. A diligent search failed to locate the nest but it is probable that the bird was breeding.

607. *Piranga ludoviciana* (Wils.).—Louisiana Tanager. Common breeder in the pines.

612. *Petrochelidon lunifrons* (Say).—Cliff Swallow. Several old nests supposed to belong to this species were found on the cliffs.

615. *Tachycineta thalassina lepida* (Mearns).—Violet-green Swallow. Several pairs were found breeding among the cliffs, but no sets secured.

629*a*. *Vireo solitarius plumbeus* (Coues).—Plumbeous Vireo. Breeding in shaded portions of cañons in trees of the mountain maple (*Acer glabrum*).

656. *Dendroica auduboni* (Towns.).—Audubon's Warbler. The breeding range of Audubon's Warbler in northwest Nebraska coincides with the distribution of *Pinus ponderosa*. The birds usually build their nest in a bunch of pine needles near the end of a branch, where it is concealed very effectually.

727*a*. *Sitta carolinensis aculeata* (Cass.).—Slender-billed Nuthatch. Often seen in the cañons and undoubtedly breeds.

754. *Myadestes townsendii* (Aud.).—Townsend's Solitaire. Two nests of the Solitaire were found in 1900—one in Gerlach's Cañon and the other in Monroe Cañon. A pair was seen in 1901, but no nest found.

758*a*. *Hylocichla ustulata swainsoni* (Caban.).—Olive-backed Thrush. Seen several times during the summer in West Warbonnet Cañon. The birds seemed partial to the shady woods around the springy head of the stream, and were very shy. Breeding probable.

768. *Sialia arctica* Swains.—Mountain Bluebird. Quite a common breeder in the higher parts of the Ridge. A dead stub on some high point is the usual nesting site.

The following stragglers were seen in the Transition: Blue Jay (*Cyanocitta cristata*), Lincoln's Sparrow (*Melospiza lincolnii*), Bluebird (*Sialia sialis*). Golden Eagle (*Aquila chrysaetos*). The Spotted Sandpiper (*Actitis macularia*) was seen at Andrews late in May, but was probably a migrant.

Species common to both Upper Sonoran and Transition

261. *Bartramia longicanda* (Bechst.).—Bartramian Sandpiper. A common breeder both on the plateau and in the valley.

264. *Numenius longirostris* (Wils.).—Long-billed Curlew. Same as preceding, but not so common.

289. *Colinus virginianus* (Linn.).—Bob-white. Heard at both Glen and Crawford.

316. *Zenaidura macroura* (Linn.).—Mourning Dove. Doves were nesting both in the wooded cañons and on the prairie—in the latter situation on the ground.

325. *Cathartes aura* (Linn.),—Turkey Vulture. Abundant.

342. *Buteo swainsoni* Bonap.—Swainson's Hawk. Not common.

348. *Archibuteo ferrugineus* (Licht.).—Ferruginous Rough-leg. Seen both on Indian Creek and around buttes on the plateau—undoubtedly breeds.

360. *Falco sparverius* Linn.—Sparrow Hawk. An abundant breeder.

375*a*. *Bubo virginianus pallescens* Stone.—Western Horned Owl. Frequenting alike the heavily timbered cañons and the cottonwoods along bad lands streams.

406. *Melanerpes erythrocephalus* (Linn.).—Red-headed Woodpecker. An abundant breeder.

412*a*. *Colaptes auratus luteus* Bangs. -Yellow-shafted Flicker. Breeding wherever there is timber.

413. *Colaptes cafer collaris* (Vigors).—Red-shafted Flicker. Same as preceding.

420. *Chordeiles virginianus henryi* (Cass.).—Western Nighthawk. Nesting on the prairie.

457. *Sayornis saya* (Bonap.).—Say's Phœbe. Nests on rocky ledges in the bad lands as well as in the heads of cañons; also in ranch outbuildings.

462. *Contopus richardsonii* (Swains.). -Western Wood Pewee. Seen wherever the timber afforded a proper environment; doubtless breeds.

466*a*. *Empidonax traillii alnorum* Brewst.—Alder Flycatcher. Scarcer than the preceding species. Breeding probable.

474*c*. *Otocoris alpestris arenicola* Hensh.—Desert Horned Lark. Abundant, both on the plateau and in the Basin.

501*b*. *Sturnella magna neglecta* (Aud.).—Western Meadow-lark. Abundant breeder throughout prairie regions.

529. *Astragalinus tristis* (Linn.).—American Goldfinch. Along streams, wherever there is sufficient tree growth.

539. *Rhynchophanes mccownii* (Lawr.).—McCown's Longspur. Breeding on the plateau as well as on the divide between Antelope and Indian creeks.

540*a*. *Pooecetes gramineus confinis* Baird. Western Vesper Sparrow. Nesting throughout prairie regions.

546*a*. *Ammodramus savannarum bimaculatus* (Swains.).—Western Grasshopper Sparrow. Same as preceding.

588. *Pipilo maculatus arcticus* (Swains.).—Arctic Towhee. Center of abundance in the wooded cañons, but following down the wooded streams well into the Upper Sonoran. Nesting on the ground, usually in thickets of *Symphoricarpus*, etc.

596. *Zamelodia melanocephala* (Swains.). Black-headed Grosbeak. Nesting in low trees, frequently in black birch (*Betula occidentalis*).

613. *Hirundo erythrogastra* Bodd.—Barn Swallow. Nesting in ranch sheds, and outbuildings.

614. *Tachycineta bicolor* (Vieill.).—Tree Swallow. Seen in small numbers around the cliffs in the higher portions of the Ridge, where it doubtless breeds. A number of swallows which I took to be of this species were seen on lower Monroe Creek in the middle of June.

622*a*. *Lanius ludovicianus excubitorides* (Swain.).—White-rumped Shrike. Abundant breeders in the bad lands, where they nest in the cottonwoods. Two pairs were also found nesting on the divide at the head of Dead Man's Cañon in small pines.

624. *Vireo olivaceus* (Linn.).—Red-eyed Vireo. Seen in Monroe and Warbonnet Cañons in May and June; also on Indian Creek in the middle of June.

627*a*. *Vireo gilvus swainsoni* Baird.—Western Warbling Vireo. Several vireos of this species were found in Monroe and Warbonnet Cañons early in the season, and a young bird shot on Indian Creek in July by Mr. Carriker.

680. *Geothlypis tolmiei* (Towns.).—McGillivray's Warbler. I saw a McGillivray's Warbler near the head of Monroe Cañon May 27, 1900, and at intervals during the summer of 1901 birds were seen in thickets of *Rhus trilobata* in bad lands pockets. I have no doubt that they were breeding in the latter locality.

681*a*. *Geothlypis trichas occidentalis* Brewst.—Western Yellow-throat. An abundant breeder in the brush and thickets along the streams.

683*a*. *Icteria virens longicauda* (Lawr.).—Long-tailed Chat. Throughout the region, wherever there are suitable thickets for nesting sites. A characteristic bird of the shrubbery.

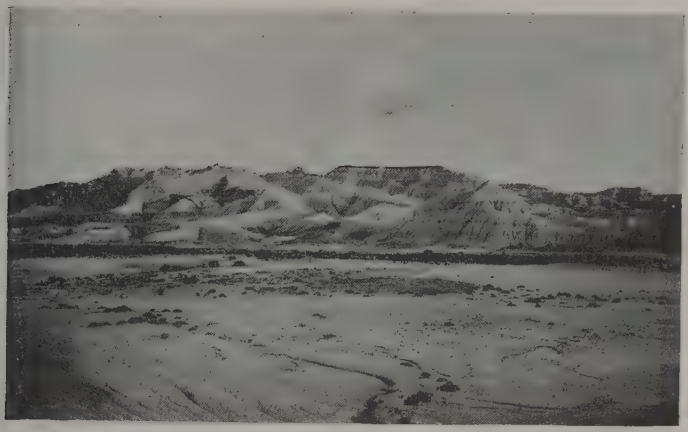
687. *Setophaga ruticilla* (Linn.).—Redstart. Commonly seen in thickets of black birch, and the two nests found were in birch trees.

715. *Salpinctes obsoletus* (Say). Rock Wren. Breed in the buttes of the plateau as well as in the bad lands, and are abundant.

721*b*. *Troglodytes aedon aztecus* (Baird).—Western House Wren. Throughout the region.

735*a*. *Parus atricapillus septentrionalis* (Harris). -Long-tailed Chickadee. A common summer resident.

761. *Merula migratoria* (Linn.).—Robin. Abundant breeder in the cañons, but scarcer in the Basin, and confined to the brush along streams.



A VIEW IN THE BAD LANDS

NOTES ON THE NESTING OF SOME SIOUX COUNTY BIRDS

M. A. CARRIKER, JR., NEBRASKA CITY

The extreme northwestern corner of Nebraska, embracing a portion of Sioux and Dawes counties, is an extremely interesting locality to the naturalist, embracing as it does portions of different life zones in close proximity. As would be expected from such conditions, the bird fauna is exceedingly varied and interesting, and not at all similar to what we have in other portions of the state.

Nearly every year for a number of years past some one has gone to this locality from the State University and considerable material and data have, as a result, been accumulated, but at no time had any party spent more than a couple of weeks at one time in the region. On account of this fact, Prof. Lawrence Bruner of the State University determined to place a party here for a considerable length of time during the early summer of 1901. Accordingly Mr. Merritt Cary, of Neligh, Neb., and myself left Lincoln on May 25, accompanied by Professor Bruner and Dr. R. H. Wolcott, also of the State University, who intended to spend the first week in camp with us. We proceeded to Harrison, the county seat of Sioux County, from whence we, together with our camp equipage, were driven about ten miles northwest to

the head of Warbonnet Cañon, where we pitched the camp, that remained as our headquarters for the two months of our stay.

A word of explanation as to the character of the country. The eastern part of Wyoming consists of a high, roughly undulating, grassy plateau, sloping gradually towards the southeast, which, after entering Nebraska, breaks off abruptly into the Hat Creek Valley. The face of the plateau along this sudden drop, which ranges from three to five hundred feet, is cut into an endless series of deep, precipitous cañons, some of which are short, while others extend back into the plateau for miles, with many twistings and side branches. The longer ones invariably become gradually shallower and finally end on a level with the surrounding country, but the shorter ones very often end in an abrupt wall of rock ranging from twenty-five to a hundred feet or more in height. The upper portion of the cañon walls is almost invariably composed of "rim rock" rising sheer from ten to even a hundred and fifty feet in height in some places. From the base of this "rim rock" there is a steep slope of earth and rocks to the usually narrow bottom, along which there is to be found in most cases a little streamlet of clear cold water. The slopes are covered with a more or less dense growth of pines (*Pinus ponderosa*) ranging from a few feet to sixty and seventy feet in height, while the rich soil along the banks of the brooks is thickly overgrown with black birch, quaking aspen, and willow, with an occasional elm and box elder. The innumerable little streams issuing from the cañons flow out into the valley where they eventually join, to form the stream known as Hat Creek. There is always a thick growth of trees and shrubs along the banks of these valley streams, but it is generally more bushy than in the cañons.

Thus it is easily seen that here is presented a variety of conditions which would be exceedingly hard to duplicate in the same extent of territory. I devoted the major portion of my time to birds, while Mr. Cary was more particularly occupied with the mammals. The following observations concern the breeding of some of the rarer or less known birds which are to be met with in that region:

Bartramian Sandpiper (*Bartramia longicauda*).—Although the nesting habits of this bird are quite well known, a few observations may not be without interest. The birds were abundant upon the grassy plateau and especially so near the heads of the cañons, where its sweet plaintive note could be heard at almost any time. The first nest, which was found by Dr. Wolcott, May 30, contained four fresh eggs of the usual type, and was merely a shallow excavation, probably made by the bird, lined with a few blades of dead prairie grass and was absolutely unprotected by any tuft of grass or weeds. The finding of this nest was accidental and careful searching on clear days proved fruitless; a startled alarm note would be heard somewhere ahead and a moment later a bird would arise, but though we searched the grass fairly blade by blade no nest could be found. Accordingly, Mr. Cary

PLATE X

NEST OF PRAIRIE SHARP-TAILED GROUSE

and I went out one foggy morning later, on July 3, with a rope to drag for nests, and were rewarded by finding two. But both nests were found exactly as Dr. Wolcott had found his, by flushing the bird almost underfoot, one by Mr. Cary and one by myself.

Sickle-billed Curlew (*Numenius longirostris*).—This bird was found breeding in some abundance on the grassy hills along Indian Creek, in the northern portion of Sioux County. On June 18 I shot an adult female and caught a young bird not more than two or three days old. Ranchmen informed me that it was a common breeder farther east in the vicinity of Ardmore and southward.

Prairie Sharp-tailed Grouse (*Pediocetes phasianellus campestris*).—In the vicinity of the S–E Ranch and along Monroe Creek were found two flocks, each of about four pairs, of this grouse. On June 18, while on our way to Indian Creek, we were informed by a cowboy of a nest beside a certain irrigating ditch. After diligent search along the wrong ditch by Mr. Crawford and myself, the same cowboy appeared opportunely and in a few moments we had the satisfaction of flushing the female from the nest of thirteen eggs, which though somewhat discolored were still beautiful to me. The nest was situated in the midst of a thick clump of tall grass on the very verge of the ditch and was merely an excavation in the earth, lined with a few grass blades and weed stalks. I returned later and secured the photograph of the nest here given. The eggs were taken June 23 and were still fresh, though the first ones must have been laid at least three weeks before that date. This was the only nest found and the birds were not abundant, these two flocks being protected by the owner of the ranch.

Sage Grouse (*Centrocercus urophasianus*).—The Sage Grouse is a rare bird in Nebraska, being found only in small numbers in the extreme northwestern corner of the state along the flats of Antelope, Sage, and Indian creeks where the rather abundant sage brush and greasewood give it shelter and food. We made every effort to procure conclusive evidence that this bird actually breeds in Nebraska. On our first trip to Indian Creek, June 18, not a bird was seen and no direct evidence procured, but on my second trip to that region, about the middle of July, I was more fortunate, for two large male birds were secured and, what was better, a flock seen consisting of an old female and ten half-grown young, all at least seven miles within the boundary of our state. These birds were without a doubt hatched and reared in Nebraska, because it is extremely doubtful whether the parent could have brought them for ten miles over high dry hills, without a drop of water, and such would have to be the case had they been hatched in South Dakota. Farther to the northwest in Wyoming, the birds are very abundant, on account of the fact that their flesh is uneatable except when young, thus making them little sought after by the ranchmen.

Sharp-shinned Hawk (*Accipiter velox*).—This bold little fellow is

found only in the cañons and is not at all abundant. One pair was located near the head of the west branch of Warbonnet Cañon, where the nest was found by Mr. Cary and myself on June 5. The nest was about twenty feet from the ground and rested on the upper side of a horizontal limb at the point where it leaned against the trunk of an adjacent tree. It required a sharp blow from a stone to flush the female from her set of four beautifully blotched eggs. The nest was left undisturbed for a few days, when I returned with a camera and secured several photographs, two of the female on the nest and one of the nest and eggs.

I was much interested in the actions of the female during the time which was occupied in taking the photos. The tree containing the nest was surrounded by numerous small trees and shrubs, many of which had to be removed before an unobstructed view of the nest could be secured. During this work the bird sat upon the nest in plain sight of me and not more than twenty feet distant. Whenever a limb gave an extra loud snap in breaking I held my breath for a moment for fear she would fly, but my fears proved to be groundless, for she remained quietly on the nest, only moving her head from side to side, until I started to climb the tree, when she flew. While busy in the tree securing a photo of the nest and eggs the female returned and alighting on a limb about fifteen feet distant sat and watched me closely, now and then shaking herself and pluming her feathers.

On July 10 I found the second nest of this pair of birds not far from the site of the first. It was in a scrubby pine, about twelve feet from the ground, and was a very flimsy structure in comparison to the other. As an additional proof of its being a second set, the eggs numbered but three, with one immaculate, while all those of the first set were blotched. Here also the female did not leave the nest until the tree was shaken. Both nests were situated in trees growing at the very bottom of the cañon and surrounded by a dense growth of deciduous trees. As in other localities, the birds are seldom seen, keeping under cover of the thick growth of trees which fill the bottoms of the cañons. At one time while walking along an old "snake" road running down a cañon, a chipping sparrow dashed across the path in front of me, closely followed by a sharp-shinned hawk. At sight of me, however, the hawk swerved suddenly and disappeared into the thicket from which it had flown in pursuit of the sparrow.

Krider's Hawk (*Buteo borealis kriderii*). I made the acquaintance of this majestic bird on June 13. It was a foggy, drizzling day and I had started out to systematically explore several cañons to the east of Warbonnet. Having ascended a cañon almost to its perpendicular head a chorus of bird cries suddenly sounded somewhere ahead of me. By this time the fog had filled the cañon, almost blotting out the sheer semicircular walls of rock which formed its head and it was some time before I could locate the cries of the birds, since they were magnified,

PLATE XI

NEST OF SHARP-SHINNED HAWK
First one referred to in text.

re-echoed and distorted by the cliffs and fog. Finally they were located as proceeding from a ledge about twenty feet from the base of the cliff, and by climbing a pine growing near I could look down into a great nest of sticks, containing three large young hawks still in the down. A moment later with a rush of wings the owner of the nest, in the form of a magnificent Krider's hawk, alighted on the ledge, but detecting my presence almost instantly, she sailed away, returning to circle screaming overhead until I had left the vicinity. A few days later, by the help of a pine, cut for the purpose, I succeeded in reaching the ledge about fifteen feet to one side of the nest. To reach the nest, however, was another problem, but with painfully slow progress I crawled along under the overhanging rock, with three pairs of round black eyes staring wonderingly at me from the nest.

The site had evidently been used by the birds for several successive years, for the pile of sticks composing the nest was at least one and one-half feet in thickness and three feet in diameter, occupying a pocket on the ledge. Fragments of skulls, vertebræ, and feet of various rodents lay scattered about, together with the vertebræ of a large snake and some fragments of a recently killed prairie-dog. Later when I attempted to secure a photo of nest and young at close range, one of the birds had disappeared leaving but two, but the photo, owing to the difficulty in taking it, did not prove to be a success. Something of the difficulty can be imagined when it is understood that I was compelled to crouch upon my knees and attempt to steady the camera while it hung suspended from a nail driven into the soft overhanging rock. On this trip I shot the male, the skin being among the others from the summer's trip. About a month later a second nest, situated in nearly the same kind of a place, was found in another cañon to the west of Warbonnet. I was unable to look into this but could hear the cries of the young. Another pair of birds was earlier seen in Monroe Cañon but no nest was located.

Prairie Falcon (*Falco mexicanus*).—Until May 26, 1901, there had been no definite record of the breeding of this falcon within our state boundaries, but upon that date a nest was found and later another. Prof. Bruner, Mr. Cary, and myself on our way to Sioux County took advantage of an enforced stop at Crawford, to rummage about among the buttes about two miles west of town. Here our attention was attracted by a prairie falcon which kept circling about a particular butte known as Saddle-back, on account of its peculiar shape. We started around this and when we arrived at the west side a second bird suddenly made its appearance, apparently from the face of the cliff above us, and joined its circling mate. At once we suspected the presence of a nest upon some ledge invisible to us from below and started around to the north side where an ascent of the butte was possible. I reached the top first and after a moment's search located the nest in a kind of pocket in the cliff about twelve feet below the

top, or rather I located the nesting site, the two recently hatched birds and one egg merely resting in a slight depression of the rock. The young were very small, not much larger than the egg, and covered with whitish down. The egg was a dull vinaceous buffy, closely sprinkled and specked with reddish brown. I wished very much to secure the egg and could probably have done so, but the soft rock was slippery from a rain of the night before and Prof. Bruner thought it unsafe to make the attempt, so I left it, but not without keen regret.

Later, when we arrived at Warbonnet Cañon, we saw a pair of falcons several times, but were for a long time unable to locate the nest. On June 21, while working the east branch of the cañon, my attention was attracted by the cries of young hawks somewhere above me; hastily clambering up the sloping side of the cañon, and following the direction of the cries, I soon located them as coming from five young prairie falcons in a hole in the cliff about thirty feet up. The cavity was wholly inaccessible except by descending on a rope from the top nearly a hundred feet above, so I contented myself by climbing a pine which grew near the cliff and taking a good look at the birds. During this operation the female dashed back and forth between me and her young, screaming incessantly. I visited the nest several times during the next month, and intended to photograph them before they left it, but other work prevented until after they had left, so the photograph taken showed only the cavity where they had been.

Sparrow Hawk (*Falco sparverius*).—The Sparrow Hawk is without doubt the most common of the Raptores of the Pine Ridge region. Every cañon contains from one to three pairs and they also straggle out into the valleys along the creeks flowing from the cañons. With two exceptions all nests were found in old holes of the Flicker or Lewis's Woodpecker. One exception was a nest found at Crawford, in a crevice in a butte near the one containing the nest of the Prairie Falcon, and made by scratching out the sand from a crevice between two strata of rock. The hole was about two feet deep and the single fresh egg was deposited on the still damp sand at its slightly enlarged extremity. The other exception was a nest found by Dr. Wolcott, on May 28, in an old dove cote near an abandoned ranch house, containing five fresh eggs of the usual coloration. However, these are, as I said, rare exceptions, the usual site being an old woodpecker's hole.

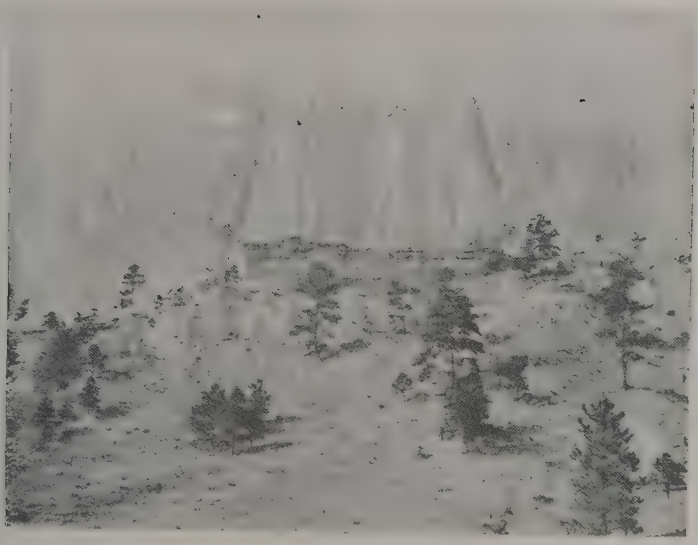
Cabanis's Woodpecker (*Dryobates villosus hyloscopus*). The breeding habits of this bird are practically identical with those of its eastern relative. It is not a common bird, but one nest being found in the cañons, and this contained young birds on June 21. The hole was excavated in a dead stub of an elm about twenty feet from the ground. The birds were, I think, more abundant in the cottonwoods along Indian Creek, some twenty miles to the north.

Poor-will. (*Phalaenoptilus nuttallii*). Not long after the setting of the sun and when the depths of the cañons are beginning to be wrapped

SADDLE-BACK BUTTE, NEAR CRAWFORD

Location of Prairie Falcon's nest indicated by a cross (×). Face of butte nearly three hundred feet sheer height.

PLATE XII



SADDLE-BACK BUTTE, NEAR CRAWFORD

Location of Prairie Falcon's nest indicated by a cross (×). Face of butte nearly three hundred feet sheer height.

in darkness, there come two clear elusive notes from somewhere along the rim-rock of the cañon. It is the first call in the nightly serenade of the poor-wills and is quickly taken up by the remainder of the orchestra along the rocky walls. There is something exceedingly weird and uncanny about it all, that fascinates the listener; the sound is echoed, magnified, and distorted by the cañon walls until one is almost led to believe that the sounds are of supernatural origin, and when a bird is by chance seen, as it flutters and glides silent as a shadow down to the bottom of the cañon, its very appearance lends support to the belief. Very seldom indeed are the birds seen in the daytime and in spite of the fact that at least three pairs were positively known to be somewhere within our cañon, a nest was searched for in vain, and we would have returned without eggs had it not been for the kindness of Mr. O. A. Peterson, a palæontologist collecting in the vicinity, who, while searching for fossil remains among the Diamonelix beds along the brow of the cañon on July 23, accidently flushed a female from her two white eggs. These lay in a slight depression on the bare white rock, right in the blazing sun, and the bird was so well protected by its remarkable adaptability to its surroundings, that it was not seen by Mr. Peterson until it flushed a few feet in front of him. The eggs were well advanced in incubation, in fact nearly upon the point of hatching, but were saved by careful treatment, though in a poor condition. They are pure glossy white, elliptical in shape and measure respectively 28x19.75 and 27x19 mm. Whether this nesting is the regular time or later than usual I do not know, but it seems to me to be quite late, as the Whip-poor-will lays in Southern Nebraska about the second week in June.

White-throated Swift (*Acronautes melanoleucus*).—This interesting bird has for several years been known to be an inhabitant of the cañons of Sioux and Dawes counties and has been supposed to breed there, but until May 30, 1901, no nest or eggs had ever been seen or taken. Indeed very little is known of the breeding of this bird anywhere on account of the usually inaccessible situation which it selects for a nesting site.

In May, 1900, a party consisting of Mr. J. S. Hunter, Mr. Merritt Cary, and Mr. J. C. Crawford, Jr., located a colony of perhaps a dozen pairs of these birds near the head of West Monroe Cañon in Sioux County, but were unable to reach the places where the birds appeared to have their nests. So in 1901 the party went with a firm determination to secure eggs of the birds. On May 30, our party, consisting of Prof. Bruner, Dr. Wolcott, Mr. Cary, and myself, visited the cliff occupied by the birds the year before and found that they had returned and to all appearances had nests, under construction at least, in the crevices of the cliff about seventy feet above the base of the perpendicular wall of rock.

The home of the birds was a bold, convex cliff, forming one wall of the cañon and facing to the southwest. On the south side, about

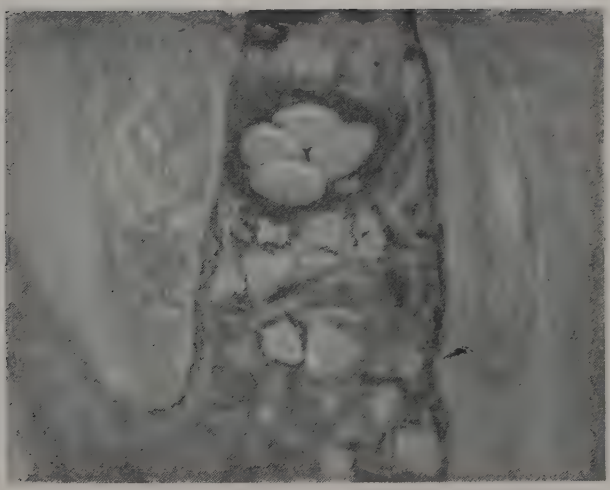
two-thirds of the distance to the top, was a ledge upon which rested the last year's nest of a pair of Krider's hawks and into which Mr. Hunter had longingly gazed, from the top of a neighboring pine, at the two eggs, so near and yet so far. Around this nest and on the west side of the cliff were scattered the nests of the swifts, as could be seen by the way in which they were constantly darting in and out of the cracks and crevices, keeping up a constant vigorous chattering as they wheeled, circled, and darted about in the vicinity of the cliff. Their swiftness of wing and the poor footing made the work of collecting any for skins well nigh an impossibility, and it was only after a long-continued fusillade that one lone bird was secured. After various plans for reaching the nests had been discussed, I volunteered to make an attempt to climb the cliff. The trunk of a small pine, cut down by Mr. Hunter the year before, lay at the base of the cliff, and when this was erected I was able to ascend about one-third of the distance to a narrow projection of rock at a point where several nests were supposed to be. As may be seen from the photograph, there is a shoulder of rock, but a few feet in width, running perpendicularly up the side of the cliff and ending in the projection I have just mentioned. This shoulder was made by a vertical section of the face of the cliff slipping down and still remaining in an upright though rather unstable condition, and it was up the narrow side of this section that I must climb in order to reach the much desired nests above. This cliff consists, as do all the rocks of the region, of a soft sandstone which is rapidly disintegrated by the action of the elements upon it. This fact made the ascent far more precarious than it otherwise would have been, since one could never tell when the portion of rock which sustained his weight would tumble away. But while this was a great difficulty, it was also the means which made it possible for me to ascend the cliff, since I was able, with the small handaxe which I carried, to cut foot and hand holds in the rock and thus gradually make the ascent.

I think anyone can appreciate the task of clinging to the nearly perpendicular face of a cliff for the length of time sufficient to cut steps for the ascent of nearly fifty feet. But persistence finally overcame all obstacles and I stood at the top within easy reach of three nests, one of which was still empty while another contained one egg and the third two. The nests were made entirely of feathers, glued into a compact mass by means of the saliva of the bird, and also securely fastened by the same means to the bottom of the vertical fissures in the rock in which they were placed. By this time Dr. Wolcott had climbed by a roundabout way to the top of the cliff and let down a coil of rope over the face of the rock to assist me in the descent. Owing to the overhanging nature of the cliff the rope hung out several feet beyond reach and I was compelled to draw the end up by means of a stout cord which I happened to have. Taking a turn of the rope around one leg I started to slide down but stopped a short distance

PLATE XIII

MR. CARRIKER AT THE SITE OF THE ROCK SWIFTS' NESTS
He was seventy-five feet up while the three hundred foot rope hanging from above just swept the base of the cliff.

PLATE XIV



A ROCK SWIFT'S NEST IN A CLEFT IN THE ROCK

The location of the camera and the dim light tended to obscure the details in the photograph.

below at a fourth nest. Clinging to the rope with one hand and leg I chopped away the rock with the other hand until the nest was reached and the four fresh eggs safely transferred to my mouth and later to the ground. On June 14, Mr. Cary and I returned to the cliff and I secured sets from the three nests which I visited first on my former ascent. On this trip I secured photographs of the cliff and the nest and eggs.

On June 2, Prof. Bruner located another nest in the west branch of Warbonnet Cañon. This was not so high as the others, being not more than twenty feet from the base of the cliff, and was easily reached by cutting a slender pine and leaning it against the cliff. But two eggs were secured from this nest. In all, five nests were found and sets secured from each,—two of four eggs, two of three, and one of two. The eggs are pure dull white more or less specked and spotted by some black foreign substance which can be only partly removed by washing. They are long and pointed, as can be seen by the measurements. The eggs in a typical set of four measured respectively: 25x15, 22x14, 22x14, 22x14 mm. The smallest of the sixteen eggs collected measures 21x13 mm., the largest 25x15; while the average is 22.7x13.6. During incubation the parent birds are much attached to the nesting locality and fly constantly back and forth before the cliff. The female sits very close, often having to be removed from the nest by force, which is dangerous to the safety of the eggs, as anyone who has seen or felt their claws can testify. The nests are invariably infested by a hemipterous insect much resembling the common bedbug. Whether these insects live parasitically upon the young birds or not, I cannot say, but none were ever found upon the adults. These birds are quite common in all the cañons of the Pine Ridge where there are large cliffs with fissures of a sufficient height from the ground to suit the birds. I also saw a few in August around the large bluff at Gering, Neb., known as Scott's Bluff.

Bullock's Oriole (*Icterus bullocki*).—Bullock's Oriole replaces the Baltimore in the western part of the state and seems partial to the cottonwood-fringed streams of the prairie and semi-arid regions. In fact the drier and less hospitable the place is, providing there are a few stunted cottonwoods to be found, the better they seem to like it, for the only nest found was one right in the center of a tract of bad lands about seven miles in extent. The tree containing the nest was a very respectable tree indeed, for that region, and grew in the bed of a creek which contained water only in the early spring and for a few hours after a heavy rain. All around were the seamed and rugged slopes of that peculiar whitish clay composing the Tertiary deposits, and which seems to reflect every ray of sunlight that beats down upon it until one thinks that every reflected ray is trying to enter his half-blinded eyes at the same moment. Here the Bullock's Oriole is at home and rears its young in peace and safety, except when

a prowling oologist happens along. The nest is almost indistinguishable from that of the Baltimore Oriole, though I think that as a general rule it is more beautiful and more artistically constructed. The eggs are smaller and partake more of the coloration of the Orchard Oriole. The nest I secured was suspended about forty feet from the ground from the lower portion of a pendant limb growing out of the middle of the tree and contained four partly incubated eggs. This was the only pair of birds seen near Pine Ridge but they were more plentiful farther north, especially along Indian Creek.

McCown's Longspur (*Rhynchophanes mccownii*).—On the 20th of June, while on our return from Indian Creek, a large flock of these birds was seen, scattered over the dry hills, just north of Antelope Creek. From their actions, the birds were evidently breeding, but there was no time to look for their nests. Later, July 4, a second flock was found upon the ridge southwest of Warbonnet Cañon and near the Wyoming line. After a few minutes' search, Mr. Cary located a nest containing half-fledged young. The nest was built very much like that of the Horned Lark, being sunken flush with the surface of the ground and made of dried prairie grass blades and rootlets. The birds were close to, and on both sides of a trail, while the nest found was but a few feet away from the beaten track with no attempt whatever at concealment or protection by weed or tuft of grass.

Western Vesper Sparrow (*Pooecetes gramineus confinis*).—While returning from our expedition to the cliff of the rock swifts, May 30, we secured our first nest of this bird. A light rain was falling and we were tramping silently along through the wet grass, when a little gray bird darted up in front of us and dropped down into a "blowout" beyond. We searched for several minutes without finding anything and would have left had the bird not appeared so anxious about our presence. Accordingly we withdrew a short distance and had hardly settled ourselves to watch when the anxious little mother fluttered back and alighted near the spot of her first appearance. While closely watching her she seemed to suddenly melt into the grass and disappear. We hastened to the spot, and when within not more than five feet of the nest she flushed a second time and we were soon looking down into the cleverly concealed little cup of woven grass which contained the five eggs she guarded so jealously, and which was tucked down into the lower part of a bunch of prairie grass and built entirely of the dead grass blades. The eggs have a bluish background, speckled, dotted, and streaked with blackish brown and light purplish shell markings. We found another nest a few days later, containing five eggs also. Mr. Cary and myself were dragging the grass for nests and as I crossed the edge of a rocky "blowout," the female flushed from almost under my feet. This nest was much less substantially built and was scarcely concealed, being sunken, flush with the surface, at the base of a few stems of grass. Two other nests were found later

PLATE XV

NEST OF BULLOCK'S ORIOLE

with young, but both resembled in structure and position the second one found more than the first.

I think that this bird is by far the most abundant sparrow of the region excepting possibly the Western Lark Sparrow, though this species is confined almost exclusively to the Bad Lands, where, in company with the Lark Bunting, it nests on the ground under the shelter of the small sage bushes which abound along the dry water courses.

Brewer's Sparrow (*Spizella breweri*).—The only place where this sparrow was seen in the region was along the draws on the north side of Indian Creek, where it was fairly abundant among the sage and greasewood. At the time of my second trip there, July 13, all had finished their incubation and were busily engaged in supplying their young with the various kinds of small worms to be found in and under the shrubs. One specimen was secured to make identification positive. All the nests noted were in the small sages close to the ground and constructed in a manner very similar to that of the Field Sparrow.

White-winged Junco (*Junco aikeni*).—This is the first record for Nebraska of the breeding of the White-winged Junco. Dr. Wolcott and Mr. Cary first saw the birds in Warbonnet Cañon soon after our arrival, but they were not seen again till June 29, when I found a nest with four nearly fledged young. I was working down a narrow gorge, whose earth-strewn sides were thickly overgrown with various kinds of vines and shrubs, when a junco darted out from one of the sides in front of me with a startled twitter and disappeared around the bend. Hastily reaching the spot where it flushed, I parted the vines and discovered where a ledge of rocks extended about a foot beyond the slope and the dirt had drifted down over it, making a little cavity under its sheltering roof. In this little nook was the nest with four young birds all able to fly, a fact which I soon discovered by their hastily escaping from the other end and taking flight down the gulch. Unfortunately I had no gun with me that day, as I was engaged in taking photographs, and when I returned the next day the whole family had disappeared.

Arctic Towhee (*Pipilo maculatus arcticus*).—Probably the most characteristic bird of the cañons is the Arctic Towhee. The bush-covered cañon slopes seem fairly alive with them and as you proceed they keep in advance, slipping in and out of the heaps of dead pine boughs, jerking their tails and uttering their querulous note.

On the morning of June 5 Mr. Cary and I found a nest in a pile of old pine boughs about twenty-five feet to one side of the tent. It was a typical nest of the Towhee, constructed of leaves, rootlets, and weed stems, and contained five fresh eggs. On June 26, while working down Warbonnet Creek about a mile below the mouth of the cañon, I found another bulky, clumsily-constructed nest in the top of a slender willow

perhaps ten feet from the ground. This nest was without question built by the present inhabitant, as the condition, material, and construction fully testified. On July 5, while searching a clump of bushes near the mouth of the cañon for a suspected nest of the Lazuli Bunting, I flushed a female towhee from fairly under my nose and parting the little rose bush I was about to walk over, looked down into a nest of the bird just flushed. It was built as a typical towhee's should be, with perhaps a little more foundation, and contained four fresh eggs.

The eggs of the Arctic Towhee vary as much in size and coloration as do those of the eastern form. Out of three sets which I secured, in one the background is almost perfectly white, in the second a decided reddish tinge, while in the third as blue as any Grosbeak's egg which I have ever seen. The largest egg measures 25x17 mm., the smallest 21x16 mm. The markings consist of fine specks, generally heavier around the larger end, running through shades of chestnut, cinnamon, rufous, and lilac.

Lazuli Bunting (*Cyanospiza amoena*).—This bird was found to be quite abundant along the creeks, after leaving the cañons, where the thickets and shrubbery afforded excellent feeding ground and nesting sites. Although the birds were frequently met with, but two nests were found, on account of the cleverness with which they were concealed. The first was on July 1, and found after a half hour's systematic search of a thicket not far from the mouth of Warbonnet Cañon, where it was deftly tucked away in the leaf-draped fork of a choke-cherry shrub, about four feet from the ground. The nest was made of grass, weeds, stems, and rootlets, lined with fine grass. The four fresh eggs were a beautiful pale blue, indistinguishable from those of the Indigo Bunting. The second nest, July 10, with four fresh eggs, was taken at the mouth of Jim Creek Cañon, and from a situation very similar to that of the first, the nest material, construction, and position being practically the same also.

During the heat of the day the birds are not often observed, keeping down in the thickets, but in early morning the male is always to be seen, perched near its nest, on the highest twig available, pouring out its song, loud, yet not harsh, and full of trills and tender cadences, while the female flits about close by.

Louisiana Tanager (*Piranga ludoviciana*).—This beautiful bird, with its golden body, blackish wings and tail, and crimson head, seems to realize that its brilliant colors are intensified by dark green foliage and consequently is rarely seen in any other tree than a pine, where it feeds, builds its nest, and rears its young. The birds were fairly abundant along the cañon slopes, but on account of the splendid cover they had for concealing their nests, but one was found. On July 27, I was slowly toiling up an almost perpendicular pine-clad slope, with a camera and tripod, when the actions of a female tanager caused me to stop and watch her. After a moment's observation, it was very

evident that she had a nest in the immediate vicinity and that I was too close to it for her peace of mind. After about fifteen minutes of upward gazing, at the expense of a nearly dislocated neck, I discovered the frail nest far out on the lowest limb of an enormous pine. Having a coil of rope with me, I secured one end to the camera and the other to myself, and after a hard climb, managed to reach the limb on which the nest was situated, where a photograph of it was obtained from the nearest possible point. It was fortunate, too, for it is the only evidence that remains of the finding of the eggs of the Louisiana Tanager in Sioux County, since the three eggs were almost upon the point of hatching and could not be saved.

The nest is constructed much like that of the Scarlet Tanager, being perhaps a trifle bulkier, and having a base of pine needles, with the main structure composed of rootlets. The eggs, too, resemble those of the Scarlet Tanager, the chief difference in this set being the heavier and more evenly diffused markings.

Plumbeous Vireo (*Vireo solitarius plumbeus*).—This bird was only added to our state list at a recent date, being found breeding for the first time by Dr. Wolcott in Sioux County in 1900. On June 15 I started to ride to Harrison and attempted to get out of the cañon by a side branch which I had never before explored, but I soon discovered the futility of the attempt. I had just arrived at a point where the cañon was a mere cleft in the side of the ridge, with steep rocky sides, covered farther up by pines and dense underbrush, and was turning my horse in order to return, when I happened to glance upward, and there just over my head hung a beautiful little cup-shaped nest, adorned with lichens and cobwebs, swinging from the forks of a drooping mountain maple. I reached up and drew it gently down, and seeing that it contained but one egg, I left it undisturbed. On the 18th we went up to Indian Creek, and it was not until the 21st that I again visited the nest, armed with shot-gun and camera. Two photographs were secured, the nest with its four eggs, and both the birds, all of which are now in the collection of the University. The nest was constructed of vegetable fibres, beautifully decorated with lichens and cobwebs, and lined with the peculiar, round, grass-like material which all vireos use for nest lining. The set consisted of four dull white eggs, sparsely specked and dotted around the larger end with burnt umber. They measure respectively: 18.5x14, 19x14.5, 18x13, and 18.5x14 mm.

Audubon's Warbler (*Dendroica auduboni*).—This beautiful warbler, resembling so much the Myrtle Warbler, was found to be surprisingly abundant among the pines of the cañons, usually more abundant from half way up the sides to the top. I think that we put in more actual time hunting for nests of this bird than any other in the region, and yet but one nest with eggs was found, by Mr. Cary on June 14. It was a rainy, foggy morning, and we were exploring systematically some cañons east of Warbonnet. While working up a side branch, we were

attracted by the peculiar actions of a pair of warblers, and began to watch them. In about ten minutes Mr. Cary located a nest by seeing the female fly to it with building material. It was situated on a horizontal limb of a small pine growing on the side of a ravine, and so cleverly tucked away in a bunch of needles that it could not possibly be seen except from one point. It was still incomplete and the full complement of four eggs was not secured until the 27th. The nest was built externally of pine bark fibres with horsehair woven into the inner part and lined entirely with fine soft feathers, many of the tips of which curled inward from the brim, nearly concealing the eggs at the bottom. The nest measured about 75 mm. in diameter externally, and 42 mm. internally; about 62 mm. in depth externally, and 30 mm. internally. The four slightly incubated eggs have a pale, greenish-blue background, and with one exception are marked around the larger end with a wreath of fine specks and dots of burnt umber and cinnamon and larger shell markings of lilac. One egg, in addition, is blotched over the entire surface with dull cinnamon. The average size is 18×13 mm.

The birds were very clever at leading a person from their nest. On several occasions I have seen both the male and female exhibit the greatest excitement when a certain place was approached and where I am sure they had no nest, because in a few moments they would quietly slip away and leave you without a clue as to where the nest really was.

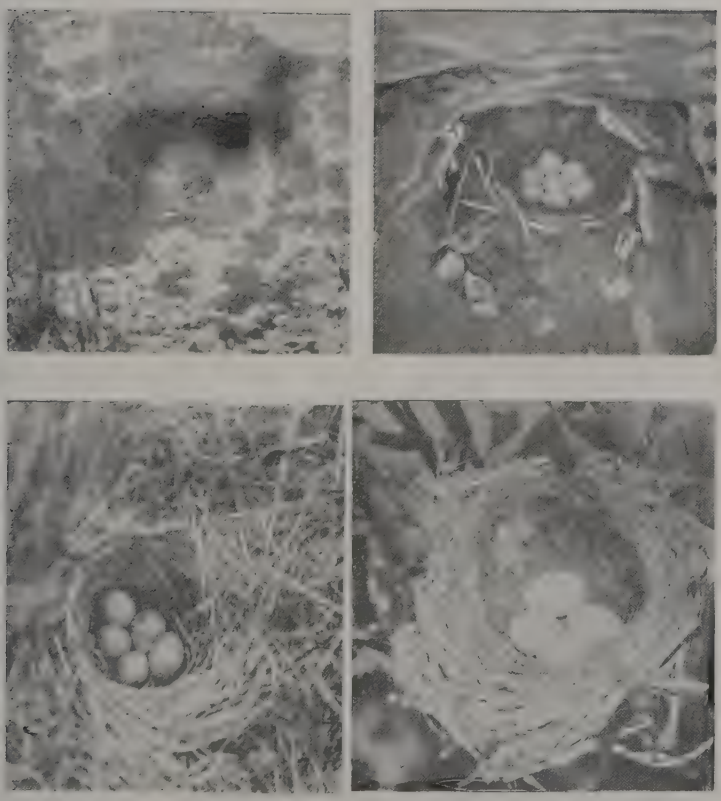
Long-tailed Chat (*Icteria virens longicauda*). Little need be said about the breeding of this bird, since its habits are identical with those of the Yellow-breasted Chat. The birds were abundant, frequenting the thickets along the valley streams, where they kept themselves and nests well hidden away. Several nests were found, the time for fresh eggs being about the 1st of July. The nests were built rather loosely of bark, roots, and grass, lined with fine round grass stems and usually placed in the centre of a thicket in a choke-cherry bush.

Mockingbird (*Mimus polyglottos*). While on Indian Creek an adult female and a young male were secured. They were in a little draw, running back from Indian Creek, the bottom of which was thickly overgrown with sage brush and greasewood and a few cottonwoods scattered along the sides.

Later, in July, Mr. Cary and I were riding along the road at the mouth of Monroe Cañon when we saw a mockingbird sitting on a fencepost at the side of the road.

Rock Wren (*Salpinctes obsoletus*).—The Rock Wren is very abundant along the Pine Ridge and in the Bad Lands, where its cheerful, though not at all melodious song and sprightly manners greatly relieve the monotony. Nesting as it does in the cracks and crannies of the rocks and clay banks, it is very frequently to be met with in the most inhospitable and usually the most inaccessible spots. Outside of the Bad Lands, perhaps the best place to find them is along the crest of the ridge around the little rocky buttes, formed by the outcropping of

PLATE XVI



A TRIO OF NESTS

Hole in butte leading to Rock Wren's nest, and nest exposed (above).
Nests of Western Vesper Sparrow at left and Lazuli Bunting at right (below).

limestone ledges and Diamonelix beds. Here, under some ledge, beneath a fallen slab of rock, or in the hole left by the disintegration of a "Devil's Corkscrew," they build their nest. While the female is attending to the family matters, the male perches on the highest point available, and entertains her with his never-changing song.

The first nest was found on June 24, placed at the end of a hole, formed by the rotting out of a "corkscrew." It was high up on the ridge, on the side of a notch, where the trail to Harrison crossed to the valley beyond. The female flushed when I put my hand into the hole, leaving her nest of seven badly incubated eggs. The hole ran horizontally into the bank for a distance of about two feet, and at its end was the nest, a loosely built, flat structure, composed of dried prairie grass, and lined with fine rootlets. The eggs are dull white, very finely speckled over the entire surface, but more thickly at the larger end, with cinnamon. A second nest with two eggs was found the same day and left until July 5, when a full set of six eggs, slightly incubated, was secured. This nest was situated on a talus slope at the foot of a limestone ledge, under a large flat rock, fallen from above, and slightly raised from the ground by a rock under one end. The nest and eggs were in every way similar to those of the first set.

BIRD AND NEST PHOTOGRAPHY

I. S. TROSTLER, OMAHA

It is not my purpose to enter into a lengthy discussion of photography, but merely to give a few general remarks upon that branch of picture-making which is becoming an important aid to us in the study of bird life. The photographer who proposes to portray birds with the camera is undertaking a very difficult branch of photography. Birds being naturally shy and timid, it is usually a very delicate and difficult matter to get them within range of the camera. This is especially true of old birds and fledglings almost ready to leave the nest. Very young nestlings can usually be photographed with little trouble. Patience is a virtue that all bird photographers should be abundantly supplied with. With this and any of the numerous cameras as an equipment, one may secure some valuable aids to bird study and instruction.

A good complete outfit is desirable, though many very fine photographs have been produced with cheap apparatus. It is the operator that makes the pictures, but the quality of the lenses, adjustments, and plates greatly modify his ability to succeed. In my opinion, the ideal outfit for this work is a long-focus camera for 5x7 plates, fitted with a Voigtlander "Collinear" lens in a Bausch & Lomb "Diaphragm" shutter, and a "Focal Plane" shutter fitted next to the plate. This gives a

lens with great speed (f5.7) and shutters working automatically from 1-1000 of a second to three seconds. The camera should have a bellows length of not less than eighteen inches, reversible and swing back, sliding front, and rack and pinion for focusing. A good strong folding tripod is necessary. This should have an Eastman "adjustable tripod top," which being made on the ball and socket principle enables the operator to tilt the camera up, down, and sidewise without moving the tripod legs. I also carry a "bicycle attachment," which I use to attach the camera to a branch when up in a tree. It is much better than to strap the tripod to the branches, and may be used at all heights and angles, as it has also a ball and socket movement. A rubber hose about twenty-five feet long with a large bulb is necessary, so that the shutter may be released when some distance away from the camera. For use in a bog or swamp, I have a "web-foot attachment" for my tripod which I find to be a great help. I place blocks of wood, one inch thick and three inches square, with hole in center to fit tightly, on the end of the tripod legs, which prevent the tripod from sinking into the muddy bottom.

The best time to secure good photographs of birds is during the breeding season, and the best places are where their nests are found. If you want to photograph a parent bird upon the nest or feeding the young, focus the camera upon the nest, connect the long hose, carry the bulb end of the hose to the nearest cover, and after setting the shutter and drawing the plate-holder slide retire to end of hose and await your chance. Here is where the supply of patience must be used. It may be necessary to wait quietly from fifteen to thirty minutes, and sometimes longer; and right here I want to impress it upon all, beginners especially, that the finest bird photographs are secured by lying in wait for a parent bird to alight upon or near the nest. One who awaits the opportunity and secures one good picture accomplishes far more than do the many who expose dozens of plates and fill albums with poor photographs.

It is frequently advisable to screen the camera with a few green boughs, being careful to leave nothing in front of the lens to obscure the view. All movements when near the nest should be quietly executed in the shortest possible time, so as not to alarm the birds unnecessarily. The photograph should be made during the lightest part of the day whenever possible, and the exposure should be as short as is consistent with the subject, lens, plate, and light. Imitations of bird cries will usually cause the parents to approach the nest, and after they find that the danger has apparently passed they frequently remain and feed the young. A sound that will usually bring the birds may be made by placing the back of the hand firmly against the opened lips and sucking, at the same time raising the angle of the mouth, thus producing a squeaking smack which sounds somewhat like the "hungry call" of a young robin.

Young birds should be photographed in or upon the nest if it is possible to secure a good light. They should not be in direct sunlight if it can be avoided, and the exposure must be very quick, on account of their fast respiratory movements. When it is impossible to secure a good picture of the young in the nest, they may be arranged upon suitable perches made of twigs or boughs, and photographed in various attitudes or groups. It is helpful to have a companion arrange the birds while you attend the camera. In cases where it is necessary to remove the young from the nest, because of its inaccessibility or insufficient light, my most successful plan of photographing young birds is to first focus upon the perch I have selected and mark it to show the limits of the plate. After everything is ready for the exposure I place the birds upon the perch and release the shutter. A whole brood of young birds may be arranged upon a branch and the plates exposed when they assume the most interesting or desirable positions. Many birds have favorite perching spots. By focusing upon one of these and carefully screening the camera the bird may be "taken" from a distance and the resulting negative enlarged if desired.

Swamps and shallow lakes containing growths of sedges, tules, and willows are splendid places for photographing nests and young. Wading is to be preferred whenever possible, as boats shift their position too easily in open water, and are too hard to push through dense tules and rushes, where many of the water birds' nests are found.

Photographing nests alone is a much easier undertaking, and with proper treatment beautiful pictures may be made of such common objects as a robin's or a catbird's nest. It is seldom advisable to point the camera downward toward the nest at any great angle, or to tilt the nest toward the camera to any considerable extent. If it is desired to show the eggs, depress the camera front a little and place a small bit of cotton or bunch of grass or leaves in the nest so as to raise the eggs up to their natural position in the center of the nest, if you have tilted it toward the camera. As some birds will desert the nest if it or the eggs are touched by the hands, it is advisable to use a small stick and carefully move the eggs with this when it is necessary. It is always best to view a nest from all sides before placing the tripod, and to select the position where the least amount of cutting out of twigs or leaves will be needed to expose the nest to view. When pruning is necessary, do as little as possible, and cut so that there will be no indication of it upon the picture. I prefer bending boughs and twigs aside and tying them, rather than cutting them off. After exposing the plates I return the twigs to their natural positions and leave the birds with their home unharmed.

Nests should *never* be photographed in direct sunlight, as the contrast between the eggs and nest and the shadows upon the eggs will be too much exaggerated and the eggs too badly overexposed. An umbrella or focusing cloth held up as a screen will give the desired shadow and a

much better result. There is usually a great contrast between the color of the eggs and the material composing the nest, which renders it necessary to overexpose upon the eggs in order to get the desired detail of the nest. Always expose for the nest, nevertheless, and correct the overexposure in development. The use of a ray screen (of picric-acid-yellow color) will reduce this overexposure, and will also bring out the delicate lilac markings found upon some eggs. When using a screen or ray filter the exposure must be increased four to eight times its usual period.

A frequent error of beginners is that they try to get the picture too large for the size of their plate. It is usually best not to fill the plate with the image of the nest. Get a little of the surroundings, so that your photograph will tell its own story as regards site, kind of bush, etc., and you will be better pleased after you have made a print from the negative. Focus upon the nest from different locations and distances, and select the one that shows the best image on the ground glass after several trials. Look at this through a blue glass to secure the monochromatic effect of a print, and you can judge better. Take plenty of time to focus carefully, and if there is no wind to swing the nest, stop the lens down and prolong the exposure, in order to get perfection of detail. I frequently stop down to 64 and sometimes to 256, and expose from one-half minute to three minutes, where I could make an equivalent exposure in one-fifth of a second with lens working at full aperture. After exposing the plates and replacing the twigs bent aside, it is well to retire to some distance as soon as possible, so as to cause the birds as little alarm as you can.

If after exposing all your plates you should find some especially desirable subject, look up your notes (which should always mention subject, plate, time of day, condition of light, and length of exposure) and see if you have a plate that is probably underexposed, or more so than any of the others. Expose this plate upon your latest find, giving *five to six times the normal exposure*, and when you develop it use a solution strong in reducing agent and bromide and weak in alkali. With proper care a negative thus produced will yield good prints after it has been intensified. The first exposure will be "lost in the shuffle."

The great majority of bird snapshots are underexposed, and unless properly developed will yield poor negatives, whose resulting prints will look like "chalk and charcoal." Although much has been said and written about the development of snapshots and underexposures, I feel justified in adding a few hints. Forcing development of underexposures is a fallacy; a bad theory which has spoiled more negatives than all other methods of development combined. The majority of photographers try to "force up" an underexposure by using a developer that is too aggressive too strong in reducing agent. The best and safest rule to follow is: *The greater the underexposure, the weaker the developer* and the longer the period of development. I

frequently leave plates in the developing solution for half an hour, and sometimes for two hours. The best all-around developer is Hauff's "Metol," and for underexposures the one-solution formula (accompanying the bottle) diluted with three or even four volumes of water is best. The separate solution formula may be used for underexposures with equally good results by taking one part of each solution and three or four parts of water. With metol, development should proceed until the image has almost disappeared, and the resulting negative will be a pleasant surprise. When only a small portion of the plate is underexposed, this may be remedied by blowing the breath upon it, through a tube of paper, during development. This will cause the developer to act more energetically upon that part, and will give a better result than when the whole plate has been treated for underexposure. Overexposed parts—as eggs in a nest—can be retarded by applying bromide solution with a soft brush, tuft of cotton, or the finger, while in the course of development. A little hypo (1 to 2 grains to the ounce of developer) is an excellent restrainer for overexposed plates.

All photographers have their favorite plates. I prefer Seed's "L. Orthochromatic" for ordinary work. This is a fast emulsion plate which is slightly sensitive to red and less sensitive to violet and blue than the ordinary dry plate. For photographs in swamps, lakes, or over water, where halation is to be feared, I find Lovell's "backed plates" very fine. These have a black paper backing which must be removed before development. They cost slightly more than the ordinary plates, but their advantages justify the slight additional expense.

A very valuable little article for bird photographers, is one on "Photographing Animals" in "The Photo-Miniature," for June, 1902, Vol. IV, No. 39. The most valuable recent books are: Among the Water Fowl, by Rev. Herbert K. Job; Bird Studies With a Camera, by Frank M. Chapman; Wild Life at Home, by R. Kearton (English); Photography for Naturalists, by Douglas English (English).

RECORD OF NEBRASKA ORNITHOLOGY

ROBERT H. WOLCOTT, LINCOLN

This contribution is expected to furnish a comprehensive view of what has been accomplished with reference to the ornithology of Nebraska up to the present time and to provide a starting point for a critical study of the birds of the state. It is planned to treat the subject under the following heads:

I. A bibliography, arranged alphabetically.

II. A review of the past changes in the boundaries of Nebraska and a description of the various government survey parties that have traversed the state, together with, so far as may be possible, an identification of all localities quoted by the early authorities.

III. A review of Nebraska ornithology, chronologically arranged.

IV. A critical enumeration of all existing Nebraska records, in systematic order.

In the collection of titles it has been decided to omit all reference to those coming under the following heads: reviews; articles by Nebraska ornithologists not referring specifically to Nebraska; articles containing only direct quotations; general works, such as Coues' Key and Ridgway's Manual, containing references in general terms, as "west to Nebraska, Kansas, etc."; articles in sporting journals, except the Forest and Stream, and articles in this which were without scientific value; newspapers; purely popular magazine articles. And yet it is recognized that in sporting journals, in magazines, and in a few newspapers there are data of real value, which the writer hopes some day to collect. All "bird-magazines" of distinctly amateur character were neglected, but in case any such periodical was found to contain material of value, no attempt was made to draw a line between various articles in it, but all were included.

It has been impossible for the author to secure access to everything in which he might find desired references and it is therefore probable that omissions occur in this bibliography. In case the reader should discover any such, information of the same will be gratefully received.

The usual form of reference has been followed. A number corresponding to the year of publication precedes each title, and brevity of citation is secured by referring to a title by its number; thus, "Bruner, 96" refers to his Notes on Nebraska Birds. What is supplied by the compiler is placed between brackets, including the insertion of a title where in the original reference there was none. Capital Roman numerals in the citation of an article refer to volumes, lower case Roman and Arabic to pages. The annotations under each title are intended merely to supplement the title in suggesting to the reader the character of the reference.

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A specimen of Goldfinch, *Spinus tristis*, with crossed mandibles, from Crete.

SHERMAN, N. A.

84 From Nebraska. Young Oologist, I, 28.
Nests of Bronzed Grackle and Mourning Dove at York.

85 From Nebraska. Young Oologist, II, 17.
Notes on several birds. Blue Gray Gnatcatcher nesting at York.

S———— AND G————.

90 The Burrowing Owl. Oologist, VII, 205-206.
At Gibson.

ED "SACRAMENTO CAPITAL."

84 California [Mountain] Quail in Nebraska. Repr. in Forest and Stream, XXIII, 63, and referred to in Auk, II, 300.
Note of their successful introduction in Hamilton county.

SAY, THOS.

23 In: Account of an Expedition from Pittsburg to the Rocky Mountains, performed in the years 1819 and 1820 * * * under the command of Major Stephen H. Long. By Edwin James. Philadelphia; 1823. 2 vols., 8vo, pp. ii+503, ii+442+xcviii, map.
Numerous species of birds described, some of them from Nebraska.

SCLATER, P. L.

62 Catalogue of a Collection of American Birds belonging to Philip Lutley Sclater, etc. London; 1862. 8vo, pp. xvi+338, 20 pls.
References to specimens from Nebraska.

SESSIONS, L.

01 Changes in the Bird Fauna of the Prairies in the Past Thirty Years. Proc. N. O. U., II, 71-73.

SHOEMAKER, F. H.

01 A Late Nest of the Ruby-throated Hummingbird. Proc. N. O. U., II, 34-38, Pls. II-IV.

SKOW, L.

00 A Plea for the English Sparrow. Proc. N. O. U., I, 38-41.

STANSBURY, HOWARD.

52 Exploration and Survey of the Valley of the Great Salt Lake of Utah, etc. Philadelphia; 1852. 8vo, 487 pp., num. ills.
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SWENK, M. H.

01 Notes on some of the Rarer Birds of Gage County. Proc. N. O. U., II, 100-101.

TAYLOR, W. E.

87 The Migration of the American Magpie to Eastern Nebraska, Twenty-five Years Ago. Am. Nat., XXI, 1122-1123.

87*a* Missouri River Crow-Roosts. Am. Nat., XXI, 1123-1124.
Near Peru.

88 A Catalogue of Nebraska Birds arranged according to the Check List of the American Ornithologists' Union. Ann. Rept. State Bd. Agr. for 1887, 111-118.
Lists 314 species.

88*a* Nebraska Crow-Roosts. Ann. Rept. State Bd. Agr. for 1887, 119-120.
Near Peru.

TAYLOR, W. E., AND VAN VLEET, A. H.

88 Notes on Nebraska Birds. Ornithologist and Oologist, XIII, 49-51, 169-172; XIV, 163-165.
A systematic list, with notes, left incomplete.

TOPPAN, GEORGE L.

90 Myadestes townsendii in Nebraska. Auk, VII, 405.
Norfolk; collected by L. Sessions.

TOUT, WILSON.

00 How to Popularize Ornithology. Proc. N. O. U., I, 34-37.

01 Ornithology in the Schools. Proc. N. O. U., II, 30-33.

TOWNSEND, A. C.

93 My First Day of Egg Collecting. Ornithologist and Oologist, XVIII, 70-74.
At Omaha.

TOWNSEND, J. K.

37 Description of Twelve New Species of Birds, chiefly from the vicinity of the Columbia River. Jour. Acad. Nat. Sci. Phil., VII, 187-193.
Fringilla bicolor, *Plectrophanes ornata*—from "Plains of the Platte River."

39 Narrative of a Journey across the Rocky Mountains to the Columbia River, etc. Philadelphia and Boston; 1839. 8vo., pp. viii+352, and appendix.
References to "Plains of the Platte."

TROSTLER, I. S.

92 The Crow around Omaha. Oologist, IX, 73-74.

92*a* Wilson's Snipe. Oologist, ix, 146-147.
Notes on habits.

92*b* Omaha Crows again. Oologist, IX, 182.
Value as scavengers.

94 The American Long-eared Owl. Naturalist (Austin, Tex.), I, 7.
Breeding at Florence; set of six eggs, April 23, 1893.

95 Among the Sandhills in Northwest Nebraska. Nidiologist, III, 8-9, 21-22.
An ornithological collecting trip, near Cody, in latter part of June, 1895.

97 Remarks on Prof. Kumlien's Correction. Osprey, I, 138.
In support of statement that Yellow-headed Blackbird nests in wild rice.

99 The Anatinæ of the Middle Missouri Valley. Museum, V, 90-91.
Twenty species—at Omaha.

99*a* Missouri River Duck Notes. Osprey, III, 131.
Twelve years' observation at Omaha.

01 Ornithology in Nebraska, and State Ornithological Societies. Proc. N. O. U., II, 13-18.

01*a* Notes regarding a Chimney Swift Tree. Proc. N. O. U., II, 48, Pl. I.
Near Omaha.

VAN SANT, ELIZABETH.

01 Young Rose-breasted Grosbeaks. Proc. N. O. U., II, 38-42, Pls. V-IX.
Observations on habits, moulting, etc.

W———, N.

80 Prairie Chickens Drinking. Forest and Stream, XIV, 126, 207. Writes from New Bedford.

Wallace, J. E.

01 Notes from Omaha. Proc. N. O. U., II, 97. Occurrence and breeding of rare species.

Ward, H. B.

01 Internal Parasites of Nebraska Birds. Proc. N. O. U., II, 63-70.

White, C. A.

93 The Raptores of Omaha and Vicinity. Oologist, X, 138-140.

Wolcott, R. H.

99 The Fall and Winter of 1898-9 in Nebraska. Bull. Mich. Orn. Club, III, 21-22.

00 A Twenty-three Years' Record kept by Dr. A. L. Child of Plattsmouth, Nebr. Proc. N. O. U., I, 11-15.

00*a* Suggestions as to an Accurate and Uniform Method of Recording Observations. Proc. N. O. U., I, 41-44.

01 On Migration Records and on our Nebraska Records. Proc. N. O. U., II, 86-93.

01*a* In Memoriam—Martin Luther Eaton. Proc. N. O. U., II, 94-95. Formerly of Fairbury.

01*b* Nesting of the Plumbeous Vireo in Sioux County. Proc. N. O. U., II, 98.

01*c* Some Lincoln Records. Proc. N. O. U., II, 99-100. Several species.

Wolfe, W. M. ("Shoshone").

89 Mid-winter Bird Notes. Forest and Stream, XXXII, 131.

89*a* Honkings from the Platte. Forest and Stream, XXXII, 212.

89*b* The Migration of the Ducks. Forest and Stream, XXXII, 256.

89*c* Migrations on the Plains. Forest and Stream, XXXII, 295. The above all relate to the movement of birds, especially game birds, at Kearney during the winter and spring of 1889.

90 The Snowy Owl. Forest and Stream, XXXIII, 511. At Kearney.

90*a* Game Birds of the Plains. Forest and Stream, XXXIII, 513. List of 50 species seen February 25 to December 26, 1889, with notes on many.

91 Leaves from a Notebook. Forest and Stream, XXXVII, 63-64.

IN MEMORIAM

JULIUS STERLING MORTON

No man has done more to develop and make Nebraska what she is to-day than J. Sterling Morton. Born at Adams, N. Y., April 22, 1823, he came to Nebraska in 1854, and lived here until the date of his death, which occurred at Chicago, Ill., April 27, 1902.

He was favored with strong mental and physical endowments, fortified with a most excellent practical education. He had fitted himself for the practice of law, and came to Nebraska with the intention of following that profession, but on arriving in the territory he saw an opening whereby he could accomplish more good than in the practice of his profession, by the developing and upbuilding of the new territory through the medium of a newspaper. Accordingly he became the editor of the Nebraska City News, and for years remained as such. Ever thereafter his able pen and eloquent voice were devoted to demonstrating the resources and possibilities of Nebraska, more especially with respect to agriculture, horticulture, and forestry. He accomplished a great work, and by a kind Providence was spared to be an eyewitness of the full fruits of his labor.

Mr. Morton was a rare character. He was honest to a fault, and extremely cautious in his formation of opinions of men and measures, but when conclusions were reached no power could change them. He was a stranger to the word "compromise." His friendship knew no bounds, and his dislikes were as strong. He was a positive man. And no man, with the means at his command, did more for the betterment of his fellows or was more helpful to those in need. He was the author of "Arbor Day," now a legal holiday in all the states in the union, was the most prominent advocate of tree-planting, and as a member of President Cleveland's cabinet was of the greatest service to agriculture and horticulture in this country. He was not only tireless in his advocacy of all other measures calculated to develop and beautify the state in which he lived, but was also an earnest champion of the cause of bird protection, and the birds found congenial surroundings in the beautiful grounds about "Arbor Lodge." It was this which led the Union to honor him, and itself, by electing him an honorary member at the second annual meeting, in January, 1901.

MRS. A. M. JACOBS

Mrs. A. M. Jacobs, *née* Miss Ida M. Simpson, was born at Lowell, Mass., October 30, 1856, and died at Wayne, Nebr., January 13, 1902. She was educated at Mount Holyoke College, Massachusetts. In 1887 she was married to Mr. Jacobs and the couple removed to Wayne the same year, at which place they afterward resided. Mrs. Jacobs was a woman of great culture and refinement and keenly sensitive to the beauty of nature. It was but natural that she should be deeply interested in birds, and, after her election to active membership in the Union in January, 1901, an enthusiastic member of our society, though known personally to but few of her fellow-members.

MISCELLANEOUS NOTES

THE CAROLINA PAROQUET

When I came to Brownville, in the spring of 1856, and for eight or ten years thereafter, there was an abundance of green parrots, or paroquets, in this vicinity. Their home and breeding place was on an island of the Missouri River, ten miles north of this place. They often came into the trees in and about the town, and were very noisy and quite tame. Many of the young ones were taken from their nests by the boys and raised by hand for pets. They could not be taught to talk. I remember that one season some young men raised a hundred or more of them for sale, sending them to other states. During the year 1866, or thereabout, they all suddenly disappeared, and never since to my knowledge have been seen or known about here. Their nesting places were in the hollows of old trees on the island referred to.

ROBT. W. FURNAS, Brownville.

ADDITIONAL NOTES ON GAGE COUNTY BIRDS

The following records should be added to those given in the Proceedings of the Second Annual Meeting, page 100:

62. *Xema sabinii* (Sab.).—Sabine's Gull. On the evening of September 2, 1899, an immature specimen of this gull was caught in a semi-exhausted condition, it being one of a small flock that had been circling about an electric light at Beatrice. I kept the captive bird for about two weeks and it proved to be a tame, confiding pet. It fed from my hand, and seemed especially fond of fresh beef, for when this was offered it became greatly excited, and repeated its shrill cry "kitti-wek, kitti-wek." After making a sketch to prove the identification, the bird was released. The only other record of this bird for the state is based on a skin in the University collection, taken at Lincoln in early September, 1899, by Mr. M. A. Carriker, Jr.

131. *Lophodytes cucullatus* (Linn.).—Hooded Merganser. In the middle of July, 1900, I saw a female with six or seven young on the Blue, and secured a young bird.

203. *Nycticorax violaceus* (Linn.).—Yellow-crowned Night Heron. On July 19, 1901, an immature male specimen of this bird was shot on the Blue River two miles east of Beatrice. It was taken at almost exactly noon while feeding under a steep bank. Excepting portions of a crayfish, the stomach contained nothing but grasshoppers.

375*a*. *Bubo virginianus pallescens* Stone.—Western Horned Owl. I saw a mounted specimen of this race of Horned Owl which had been taken near Beatrice on or about December 20, 1898.

757. *Hylocichla aliciae* (Baird).—Gray-cheeked Thrush. An adult female was shot by me near Beatrice, May 15, 1901, the skin being now in my collection. This is the first definite record for this bird in the state.

M. H. SWENK, Lincoln.

NOTES FROM CUSTER COUNTY

I found the Say's Phoebe nesting four miles south of Callaway on the ledge of a sod house; at Oconto it remained throughout the season around the station and the mill; at Sumner around the station and four miles north; at Riverdale around the station. I had good evidence of its breeding at Chadron, and it is an interesting question whether the bird is not extending its range eastward.

The White-rumped Shrike has bred for several years five miles southwest of Callaway. On October 3, 1902, I saw a magpie six miles south, but had no chance to inquire whether it bred in the cottonwoods, as it does at Chadron.

The Marsh Hawk disgraced its good name by chasing chickens very fiercely, in the country, where I was staying in October. My host told me they saw the same performance frequently. Swainson's Hawks passed through Callaway in a flock of a hundred or more the past year and the year before.

The Purple Martin is abundant here, only five miles east of the 100th meridian, the farthest west I have observed them.

J. M. BATES, Callaway.

SHORT-BILLED MARSH WREN AND CAROLINA WREN AT LINCOLN

On the 28th of August, 1902, while in a tract of marshy hay land and sloughs north of Salt Lake, near Lincoln, in company with Mr. M. H. Swenk, the writer found a nest of the Short-billed Marsh Wren, empty but apparently having been used this season. Several birds of this species were in the vicinity. This is the first record of its breeding in this part of the state. Mr. J. C. Crawford, Jr., has found it breeding at West Point, but it is a rare bird in Nebraska. On September 27 the same locality was visited and the birds found still present, singing, and specimens were taken.

On February 20, 1902, Mr. J. S. Hunter shot a specimen of the Carolina Wren near Roca, twelve miles south of Lincoln. The bird was on a large, hollow tree in the timber along the creek exploring the edge of a cavity, into which it fell when shot. The specimen is in the collection of the Union. This species has only been seen twice before in the state, once by Prof. Aughey and once by Prof. Bruner. Both records were from Richardson County, in the very southeastern corner, and it is many years since they were made.

ROBERT H. WOLCOTT, Lincoln.

THE NEBRASKA ORNITHOLOGISTS' UNION

ESTABLISHED 1899

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PROCEEDINGS

OF THE

NEBRASKA ORNITHOLOGISTS' UNION

AT ITS

FOURTH, FIFTH, SIXTH, SEVENTH AND EIGHTH ANNUAL MEETINGS

Lincoln, Nebr., January 24, 1903
Lincoln, Nebr., January 30, 1904
Omaha, Nebr., December 31, 1904
Lincoln, Nebr., December 29, 1905
Lincoln, Nebr., January 19, 1907
Adjourned to Weeping Water, Nebr., May 18, 1907.

EDITED BY
MYRON H. SWENK

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VOL. IV, PART 1 FEBRUARY 8, 1908

PROCEEDINGS OF THE

NEBRASKA ORNITHOLOGISTS' UNION

OFFICERS

1902. President.....J. M. Bates, Callaway
Vice-President.....Mrs. George H. Payne, Omaha
Recording Secretary.....R. H. Wolcott, Lincoln
Corresponding Secretary..J. C. Crawford, Jr., West Point
Treasurer.....August Eiche, Lincoln
Executive Committee..... H. B. Ward, Lincoln; H. M. Benedict, Omaha; Merritt Cary, Neligh

1903. President.....F. H. Shoemaker, Omaha
Vice-President.....Anna E. Caldwell, Lincoln
Recording Secretary.....R. H. Wolcott, Lincoln
Corresponding Secretary..J. C. Crawford, Jr., West Point
Treasurer.....August Eiche, Lincoln
Custodian.....Myron H. Swenk, Lincoln
Executive Committee..... G. E. Condra, Lincoln; J. A. Dickinson, Gresham; H. B. Lowry, Lincoln

1904. President.....R. H. Wolcott, Lincoln
Vice-President.....Mrs. C. S. Lobingier, Omaha
Recording Secretary and Custodian, Myron H. Swenk, Lincoln
Corresponding Secretary.....E. H. Jones, Dunbar
Treasurer.....August Eiche, Lincoln
Executive Committee..... Anna E. Caldwell, Lincoln; H. B. Duncanson, Peru; S. R. Towne, Omaha

1905. President.....Wilson Tout, Dunbar
Vice-President.....Agnes M. Dawson, Omaha
Recording Secretary and Custodian,
Myron H. Swenk, Lincoln
Corresponding Secretary.....Anna E. Caldwell, Lincoln
Treasurer.....F. H. Shoemaker, Omaha
Executive Committee.....Lawrence Bruner, Lincoln; R. H. Wolcott, Lincoln; August Eiche, Lincoln

1906–7. President.....S. R. Towne, Omaha
Vice-President.....Mrs. George H. Payne, Omaha
Recording Secretary, Custodian, and Editor,
Myron H. Swenk, Lincoln
Corresponding Secretary....Elizabeth Van Sant, Omaha
Treasurer.....F. H. Shoemaker, Omaha
Executive Committee.....H. B. Lowry, Lincoln; E. H. Barbour, Lincoln; Wilson Tout, Dunbar

STANDING COMMITTEES 1907

Record Committee.—R. H. Wolcott, chairman; Myron H. Swenk, Lawrence Bruner, F. H. Shoemaker, I. S. Trostler, J. A. Dickinson.

Educational Committee.—Wilson Tout, chairman; Caroline Stringer, Lawrence Bruner, H. B. Duncanson, Anna Caldwell, Mrs. A. E. Sheldon.

Advisory Editorial Committee.—Myron H. Swenk, chairman; R. H. Wolcott, Lawrence Bruner.

ABSTRACT OF MINUTES

FOURTH ANNUAL MEETING

The fourth annual meeting of the Nebraska Ornithologists' Union was called to order in room 301 of Mechanic Arts Hall, University of Nebraska, at 11:30 A.M., January 24, 1903, with President Bates in the chair. Fifteen members were present.

The Recording Secretary reported that the proceedings of the third annual meeting, having been unavoidably delayed in publishing, were about to come from the press. He also described a card catalogue of the members which he had prepared. His report was, on motion of Lawrence Bruner, accepted and adopted. The Corresponding Secretary then briefly reported on the duties of his office. The report of the Treasurer was, in his absence, read by the Recording Secretary. On motion of Lawrence Bruner, the report was referred to an auditing committee to be appointed by the chair. The President appointed as this committee Lawrence Bruner, Elizabeth Van Sant, and J. C. Crawford, Jr. The Record Committee reported considerable progress. On motion of H. B. Ward, all new business was left to the afternoon session. The Corresponding Secretary then reported on the result of the mail ballot and pronounced the following officers as elected:

President, F. H. Shoemaker, Omaha,
Vice-President, Anna E. Caldwell, Lincoln,
Corresponding Secretary, J. C. Crawford, Jr., West Point,
Treasurer, August Eiche, Lincoln,
Executive Committee, Geo. E. Condra, Lincoln; J. A. Dickinson, Gresham; H. B. Lowry, Lincoln.

On motion of Lawrence Bruner, the present Recording Secretary was continued in office for the coming year, in accordance with the previously expressed desire of the Union to make this a permanent office. The creation of the office of Custodian was accomplished, and Myron H. Swenk of Lincoln appointed by the Executive Committee to fill it. Adjournment at 12:20 P.M. to

meet again at 2:30 P.M. On reassembling the following program was enjoyed:

President's Address, "Birds and Man".....J. M. Bates
"Educational Value of Bird Study".....Mrs. C. S. Lobingier
"Devices for Interesting Children in Bird Study"..Anna Caldwell
"Observations of the Number of Birds to the Square Mile in Custer County".....J. M. Bates
"Birds of the Niobrara Valley".....Myron H. Swenk
"Birds of Cherry County".....R. H. Wolcott

Each of these papers was thoroughly discussed by the members after presentation.

The matter of forming an Audubon Auxiliary was presented by the Recording Secretary, and a scheme, with a proposed constitution, for its organization presented. He then moved the appointment of a committee to control this organization. H. B. Ward moved as a substitute motion that a committee of five be appointed by the President to take in charge the bird protection work in this state, and that the matter be referred to this committee for action. Carried. The President appointed Wilson Tout, chairman, and Anna Caldwell, Mrs. C. S. Lobingier, Lawrence Bruner, and R. H. Wolcott as this committee.

The proposed amendments to the constitution were read, and, on motion of Lawrence Bruner, were adopted. A motion by Lawrence Bruner that with the sanction of the Executive Committee the secretaries be empowered to accept for publication articles on birds not found in Nebraska was carried. A motion by Lawrence Bruner that a committee of five be appointed to take in charge the execution of a proposition to make the fifth annual meeting one devoted especially to game birds was carried. The President appointed as the committee R. H. Wolcott, chairman; Lawrence Bruner, G. B. Simpkins, I. S. Trostler, J. M. Bates. A motion by R. H. Wolcott that the Secretary be empowered to prepare the published volumes of the proceedings in bound form, provided any member authorized by the President would care to take the matter in charge, was carried. F. H. Shoemaker moved that the business transactions carried on at the morning session be ratified. After reading of minutes they were

adopted. A motion made by R. H. Wolcott that the Auditing Committee continue in office and report to the Secretary for publication was carried. A vote of thanks to the retiring President was given and the new President introduced. Adjournment.

R. H. Wolcott, *Secretary.*

First Annual Field Day.—This meeting was held at Lincoln, May 9, 1903, the party dividing into two sections, one taking the train to Waverly and returning through the woods along Salt creek, the other section going around the lake west of Lincoln and visiting the adjacent sloughs. The composite list reached 104 species and subspecies for the day.

FIFTH ANNUAL MEETING

The fifth annual meeting of the Nebraska Ornithologists' Union was called to order in room 301 of Mechanic Arts Hall, University of Nebraska, at 11:30 A.M., Saturday, January 30, 1904, and, in the absence of President Shoemaker, Vice-President Anna E. Caldwell presided. Twelve members were present.

The Secretary read a letter from President Shoemaker conveying his deep regret at the unavoidable circumstances which prevented his being present at the meeting, after which he presented an informal report on the duties of his office. The Treasurer's report was then read, and on motion to that effect by R. H. Wolcott, an auditing committee was appointed by the chair. This committee was Lawrence Bruner, Myron H. Swenk, and Wilson Tout. Informal reports from the Custodian, Record Committee, and Committee on Bird Protection were presented. The Executive Committee then reported on the mail ballot. The following officers were declared elected:

President, R. H. Wolcott, Lincoln,
Vice-President, Mrs. C. S. Lobingier, Omaha,
Corresponding Secretary, E. H. Jones, Dunbar.
Treasurer, August Eiche, Lincoln,
Executive Committee, Anna Caldwell, Lincoln; H. B. Duncanson, Peru; S. R. Towne, Omaha.

The amendment increasing the dues to $2 for active and $1 for associate membership was declared passed, as was also the amendment fixing the quorum at the members present; but that allowing ornithologists from outside the state to become active members was lost. The Executive Committee appointed Myron H. Swenk to the office of Recording Secretary and Custodian. Adjourned at 12:30 to meet again at 2:30.

After calling to order, a discussion of the proposed amendments was indulged in. I. S. Trostler moved the adoption of the amendment increasing dues. Carried. A motion by Lawrence Bruner that there be created a list of subscribers was carried. A motion by Lawrence Bruner that the amendment fixing the quorum at the members present be adopted was presented, and amended by I. S. Trostler that that number be not less than nine. Motion as amended carried. Motion by I. S. Trostler that the amendment allowing ornithologists from outside the state to become active members be laid on the table. Carried. A motion that the present Committee on Bird Protection be continued was carried. On motion of J. M. Bates, article IX was changed to read, "two-thirds of members voting" instead of "two-thirds of the active members." Article VI, section 1, was changed to read "one month before the date of annual meeting," instead of "by the first day of November in each year." All business having been transacted, the following program was presented:

President's Address, "Birds of Childs Point, Near Omaha" (read by title).....F. H. Shoemaker
"The Bird Fauna of Cut-Off Lake, Near Omaha"..I. S. Trostler
"Additional Notes on Cherry County Birds".....R. H. Wolcott
"Some Bird Horizons".....Wilson Tout
"Notes Taken in 1903 on the Birds of Sioux County," Lawrence Bruner
"California Avian Notes".....J. S. Hunter
"Bird Observations of a Two Days' Tour in Southwestern Nebraska".....Myron H. Swenk
"May Lists at Lincoln".....R. H. Wolcott
"Notes From Norfolk".....J. H. Mackay

A motion was then made by R. H. Wolcott that a Field Day be held at Omaha the coming May 14. Carried. Installation of

new officers, and vote of thanks for retiring ones. Adjournment.

R. H. Wolcott, *Secretary.*

Second Annual Field Day.—In compliance with Dr. Wolcott's resolution passed at the Annual Meeting, the Field Day was held at Pries' lake, near Florence, Douglas county, May 14, 1904, 79 species being recorded for the day.

SIXTH ANNUAL MEETING

The sixth annual meeting of the Nebraska Ornithologists' Union was called to order at 11:00 A.M. in the lecture room of the Omaha public library, Saturday, December 31, 1904, with President R. H. Wolcott in the chair. Eleven members were present.

The report of the Recording Secretary and Custodian was given verbally and briefly by Myron H. Swenk, and on motion of Anna Caldwell was accepted. The Treasurer was not present, and, having prepared no statement in writing, President Wolcott gave a verbal report previously conveyed to him by the Treasurer. On motion of Wilson Tout the chair appointed Lawrence Bruner and H. B. Lowry as an auditing committee to examine and report on the Treasurer's report when completed. President Wolcott reported for the Record Committee and Wilson Tout for the Bird Protection Committee. Three names were proposed for membership and unanimously elected. Wilson Tout resigned from the chairmanship of the Bird Protection Committee, owing to lack of time for continuing in that capacity, and the committee was discontinued. The officers were then announced by the Secretary. The ballot showed the election of the following members:

President, Wilson Tout, Dunbar,
Vice-President, Agnes M. Dawson, Omaha,
Corresponding Secretary, Anna Caldwell, Lincoln,
Treasurer, F. H. Shoemaker, Omaha,
Executive Committee, Lawrence Bruner, R. H. Wolcott, and August Eiche, all of Lincoln.

Upon request, Wilson Tout, the President-elect, responded briefly, explaining his appreciation of the honor bestowed upon him by the Society. He also moved the adoption of a resolution that the Union extend a vote of thanks to Lawrence Bruner, R. H. Wolcott, and Myron H. Swenk, the authors of the new "Birds of Nebraska," which was carried unanimously. Lawrence Bruner responded briefly. The Union then adjourned at 12:00 M. to accept the hospitality of S. R. Towne at dinner, and meet again at 2:00 P.M.

The afternoon session was called to order at 2:45 P.M. Reading of papers being in order, the following program was rendered:

President's Address, "An Analysis of Nebraska's Avifauna," R. H. Wolcott
"Bird Observations at Home".....Mrs. G. A. Loveland
"The Dunbar Bird Club".....Wilson Tout
"The Birds of Lincoln and Vicinity".....Myron H. Swenk
"The Arkansas Kingbird and Brewer Blackbird in Knox County".....I. S. Trostler
"The Economic Aspect of Birds".....Lawrence Bruner
"Methods of Bird Food Study".....J. S. Hunter

The minutes were approved. The date of the Field Day was left to the Executive Committee. A motion was passed giving a vote of thanks to the retiring officers. Adjournment.

MYRON H. SWENK, *Secretary.*

THIRD ANNUAL FIELD DAY.—The Executive Committee decided to hold this meeting at Dunbar, Nebraska, May 5 and 6, 1905. In the evening of May 5 a very interesting and well-attended public meeting was held in the town hall, Messrs. Sheldon, Swenk, and Bruner being the speakers of the evening, Wilson Tout presiding. A very enjoyable field meeting was held the next day, though unfavorable weather held the composite list down to 69 species.

SEVENTH ANNUAL MEETING

The seventh annual meeting of the Union was held in room 301, Mechanic Arts Hall, University of Nebraska, on December

29, 1905. President Tout called the meeting to order at 2:10 P.M. with eleven members present. The Secretary and Custodian gave a brief verbal report, and, in the absence of the Treasurer, read that officer's report. On motion it was referred to the Executive Committee to audit. A motion extending thanks to the Treasurer and Secretary for their efforts during the past year was unanimously carried. R. H. Wolcott responded briefly for the Record Committee. New business being in order, an extended discussion of the problem of publication was taken up, and finally a motion by R. H. Wolcott that the resources of the Union be devoted to the publication of a quarterly, just as large as possible without incurring indebtedness to the Society, the details to be left to the judgment of the editor, was carried, Wilson Tout desiring to go on record as opposed to the quarterly idea. The Secretary then moved that a permanent Advisory Editorial Committee of two be appointed to confer with, advise, and assist the Secretary in editing the publication, to assume a partial responsibility for it, and to start any new incumbent in the duties of the office. The motion was carried. The President appointed Lawrence Bruner and R. H. Wolcott as members of the Advisory Editorial Committee. R. H. Wolcott then moved that a committee of five be appointed as an Educational Committee to take charge of the educational aspect of the Union's aims. The motion prevailed, and the chair appointed Caroline Stringer, Lawrence Bruner, H. B. Duncanson, Anna Caldwell, and Margaret Thompson as the Educational Committee. No amendments to the Constitution were presented. The Secretary then announced the officers for 1906, as follows:

President, S. R. Towne, Omaha,
Vice-President, Mrs. G. H. Payne, Omaha,
Treasurer, F. H. Shoemaker, Omaha,
Corresponding Secretary, Elizabeth Van Sant, Omaha,
Executive Committee, H. B. Lowry, Lincoln; E. H. Barbour, Lincoln; Wilson Tout, Dunbar.

The permanent office of Recording Secretary and Editor was retained by Myron H. Swenk. The afternoon session then adjourned.

The evening session was called to order at 8:30 P.M. President Tout addressed the society upon the subject of "Bird Educational Methods," after which the following program was rendered:

"Some Expedients Used in Nest Building".....R. H. Wolcott
"The Principal Bird Records for 1905".....Myron H. Swenk
"A Sand-Hill Heronry".....R. H. Wolcott
"Some Peculiar Birds' Nests".....Lawrence Bruner
"The Early Nesting of the Sierra Crossbill".....P. B. Peabody

After the program R. H. Wolcott moved that Wilson Tout be elected chairman of the Educational Committee, and the motion unanimously prevailed. The minutes of the meeting were read and accepted. Adjournment.

MYRON H. SWENK, *Secretary.*

FOURTH ANNUAL FIELD DAY.—By announcement of the Executive Committee, the fourth annual Field Day was held at Peru, May 4 and 5, 1906. On the evening of May 4, exercises were held in the Peru Normal chapel, at which time addresses were given by members of the Union. Wilson Tout acted as chairman of the meeting. R. H. Wolcott gave an illustrated talk on the birds he had observed and photographed in Cherry county during the past two summers. Myron H. Swenk followed with an illustrated discussion of North American birds which have become extinct or are now approaching extinction. Lawrence Bruner then spoke on the problem of bird protection, laying special emphasis upon the local aspects. During the evening several selections by the Peru Male Quartet were very much enjoyed by all. The next day a large and interesting list of birds was secured by the members of the Union among the hills about the town.

EIGHTH ANNUAL MEETING

The eighth annual meeting of the Nebraska Ornithologists' Union was held in two sessions: the first in room 301, Mechanic Arts Hall, University of Nebraska, on Saturday, January 19, 1907; the second or adjourned session in the First Congregational Church at Weeping Water, Nebraska, on Saturday, May 18, 1907.

The first session was called to order at 2:30 P.M. with President Towne in the chair. Ten members were present. The officers reported briefly, and the Treasurer not being present, his report was read by R. H. Wolcott. Myron H. Swenk reported for the Record Committee. Wilson Tout reported much progress by the Educational Committee, of which he is chairman, and outlined some of the lines of work he proposed to take up. As the meeting had been primarily convened for special business, the program, election, and installation of officers and election of members was postponed until the fifth annual May Field Day, which it was unanimously voted should be held at Weeping Water, Nebraska, May 3 and 4, 1907, and which should be considered as an adjourned session of the present meeting. (Owing to the highly inclement weather of these dates, the meeting was later postponed by the Executive Committee to May 18.)

The proposed changes outlined in the Corresponding Secretary's letter of January 14, as voicing the suggestions of the Executive Committee, were then thoroughly debated, pro and con, and it seemed the sentiment of the members that the changes there advised were desirable, namely, (1) the reduction of membership classes to one class to be known as *members,* with annual dues of $2, (2) the combination of the offices of Recording and Corresponding Secretary, the abolishment of the office of Custodian, and the formation of the Executive Committee from the officers, and (3) the abandonment for the present of further attempts to carry on bird protection work as started by the Bird Protection Committee and the Audubon Auxiliary of the N. O. U.

It was then moved that the Constitution be taken up, section by section, and proposed amendments be acted upon. The following amendments were carried unanimously:

1. That in article I, section 2, the words, "to encourage the proper study of ornithology in the schools and to foster the cause of bird protection," be cut out, and the words, "and to encourage the study of birds in the state of Nebraska," be substituted.

2. That article II, section 1, be entirely cut out and that section 2 be numbered section 1, except that the words, "and active," be cut out, and the words, "only members of this class," be supplanted by the words, "all members," and the words, "in good standing," be inserted.

3. That article II, section 3, be entirely cut out, and that section 4 be numbered section 2, and that section 5 be numbered section 3, and that section 6 be entirely cut out.

4. That in article IV, section 1, the words, "a Recording Secretary, a Corresponding Secretary," be cut out and the words, "a Secretary," be substituted, and the words, "and a Custodian," be cut out.

5. That in article IV, section 2, the words, "three members elected by the Union with the President and Recording Secretary as ex-officio members. The chairman shall be the elective member of the committee that received the largest number of votes," be cut out, and the words, "the officers," substituted.

6. That in article IV, section 3, the words, "on Records and Migration," be cut out.

7. That in article V, section 1, the words, "provided for in article IV, section 3," be cut out, that sections 3 and 4 of Article V be combined under "Duties of the Secretary," and that the words, "to have charge of all property of the Union," be inserted in this section, that section 5 become section 4, that section 6 be cut out, that section 7 become section 5, and that in this section the words, "and place," be inserted and the words, "to decide the election in case of a tie," be cut out.

8. That in article VI, section 1, the words, "and the Executive Committee," "a mail," "of active members of the Union," "Corresponding," and "active," be cut out, and in section 2 the words, "except that the offices of Recording Secretary and Custodian shall be considered permanent," be cut out.

9. That in article VIII, section 1, the words, "active," be cut out, that sections 2 and 3 be entirely cut out, and sections 4 and 5 become 2 and 3 respectively.

10. That in article IX, section 1, the word, "active," be cut out.

11. That in section 3 of the by-laws "Secretary" be substituted for "Custodian," and in section 6 the word "active" be cut out.

It was moved and carried that the Secretary redraft the constitution embodying the above amendments, and the copy be submitted to the Executive Committee for approval before publication. Adjournment at 5:30 P.M.

The second session was called to order at 7:30 P.M. with A. E. Sheldon as chairman, President Towne having found it impossible

to be present. Four new members were elected. The place and time of the next meeting were discussed, several localities being mentioned, Bellevue and Crete prominently, and the matter was turned over to the Executive Committee for final decision, as the constitution provides. A resolution was unanimously passed expressing the preference that the winter meetings be discontinued, and that all business be transacted in the evening of the Annual Field Day, the reason assigned being that many could not attend both meetings, and preferring the Field Day, the attendance at the business meetings was very small. The report of the Treasurer was submitted, and Lawrence Bruner and Wilson Tout were appointed as Auditing Committee. Wilson Tout reported on the May Day Contest inaugurated by the Educational Committee, and provision was made by the Society for furnishing and distribution of the prizes. The election of officers then proceeded by ballot, with the following result:

President, Myron H. Swenk, Lincoln,
Vice-President, Emily Wood, Omaha,
Secretary, Wilson Tout, North Platte,
Treasurer, F. H. Shoemaker, Omaha.

The meeting then adjourned at 8:15 P.M., and repaired in a body to the church auditorium to hear the address by Lawrence Bruner on the subject, "Why We Study Birds," which was attended by an interested audience of the townspeople of Weeping Water.

MYRON H. SWENK, *Secretary.*

FIFTH ANNUAL FIELD DAY.—The entire day of Saturday, May 18, was given over to exploring the woods about Weeping Water and observing the birds. During the day 93 species were seen by members of the Union, an unexpectedly large list for so late in the season.

Report of Treasurer, 1902-1904

RECEIPTS

Balance from previous Treasurer, February 1, 1902	$64.63
Balance from previous Treasurer, January 22, 1903	10.00
4 Annual dues for 1901—Active	4.00
4 Annual dues for 1901—Associate	2.00
44 Annual dues for 1902—Active	44.00
32 Annual dues for 1902—Associate	16.00
61 Annual dues for 1903—Active	61.00
61 Annual dues for 1903—Associate	30.50
37 Annual dues for 1904—Active	74.00
31 Annual dues for 1904—Associate	31.00
2 Annual dues for 1905—Active	4.00
Sale of Proceedings: 1902	7.20
1903	6.70
1904	40.75
	$395.78

EXPENDITURES

Paid State Journal Co., February 20, 1902, on II Proceedings	$50.00
Paid State Journal Co., April 15, 1902, on II Proceedings	25.00
Paid State Journal Co., October 28, 1902, balance on II Proceedings	11.05
Postage for 1902	1.50
Paid State Journal Co., September 5, 1903, on III Proceedings	75.00
Paid State Journal Co., January 15, 1904, on III Proceedings	25.00
Postage and stenographic work for 1903	15.25
Paid Cornell Photo and Engraving Co., for plates in III Proceedings, February 2, 1904	20.00
Paid Jacob North & Co., for printing indices, February 3, 1904	24.00

Paid State Journal Co., March 25, 1904, on III Proceedings	20.00
Paid State Journal Co., May 24, 1904, on III Proceedings	20.00
Paid State Journal Co., June 16, 1904, on III Proceedings	10.00
Paid State Journal Co., October 3, 1904, on III Proceedings	15.00
Paid State Journal Co., November 2, 1904, on III Proceedings	10.00
Paid State Journal Co., December 12, 1904, on III Proceedings	10.00
Paid State Journal Co., December 17, 1904, on III Proceedings	15.00
Paid State Journal Co., January 4, 1905, on III Proceedings	14.78
Postage, stationery, and stenographic work for 1904	21.45
Balance on 1902 banquet, May 5, 1904	4.00
Paid Woodruff-Collins Printing Co., October 10, 1904	6.75
Paid New Century Printing Co., December 16, 1904	2.00
	$395.78

Respectfully submitted,

AUGUST EICHE, *Treasurer.*

REPORT OF TREASURER, 1905-1907

RECEIPTS

1	Annual dues for 1903—Associate	$ 0.50
2	Annual dues for 1904—Active	4.00
3	Annual dues for 1904—Associate	3.00
31	Annual dues for 1905—Active	62.00
18	Annual dues for 1905—Associate	18.00
18	Annual dues for 1906—Active	36.00
10	Annual dues for 1906—Associate	10.00
3	Annual dues for 1907—Active	6.00
		$139.50

EXPENDITURES

Paid State Journal Co., August, 1905, on III Proceedings..	$ 15.00
Paid State Journal Co., November, 1905, on III Proceedings	20.00
Paid State Journal Co., December, 1905, balance on III Proceedings	32.37
Receipt books and postage for Treasurer	5.06
Postage for Secretary	1.42
Stenographic work	.25
Premium on money orders	.20
Balance on hand, May 18, 1907	65.20
	$139.50

Respectfully submitted,

FRANK H. SHOEMAKER, *Treasurer.*

CONSTITUTION AND BY-LAWS

ARTICLE I. (Name and Object)

Section I. This Association shall be known as The Nebraska Ornithologists' Union.

Sec. 2. Its aims shall be to promote the study of ornithology by more closely uniting the students of this branch of natural history, and to encourage the study of birds in the state of Nebraska.

ARTICLE II. (Members)

Section 1. Any student of ornithology resident in Nebraska, not less than sixteen years of age, may become a member on receiving a majority vote of the members present at any meeting. All members in good standing shall have the right to vote and hold office.

Sec. 2. Honorary members shall be elected for their eminence in ornithology or for distinguished services in furthering the aims for which this Union is established.

Sec. 3. Application for membership in the interim between meetings may be considered by the Executive Committee, and the application granted by a unanimous vote of the committee.

ARTICLE III. (Quorum)

Section 1. A quorum for the transaction of business shall be the active members present at any annual meeting, provided the number is not less than nine.

ARTICLE IV. (Officers and Committees)

Section 1. The officers of this Union shall be: a President, a Vice-President, a Secretary, and a Treasurer.

Sec. 2. There shall be an Executive Committee consisting of the officers.

Sec. 3. Standing committees shall be appointed by the President with the concurrence of the Executive Committee.

ARTICLE V. (DUTIES OF OFFICERS AND COMMITTEES)

Section 1. Duties of the President. It shall be the duty of the President to preside at all the meetings of the Union, to appoint the standing committees, and to perform such other duties as may properly pertain to the office.

Sec. 2. Duties of the Vice-President. It shall be the duty of the Vice-President to act in the absence or incapacity of the President.

Sec. 3. Duties of the Secretary. It shall be the duty of the Secretary to keep a record of the meetings of the Union, to countersign all orders and documents issued by the President, to conduct the general correspondence of the Union, to prepare the program of the meetings, to send out the call for such meetings, to superintend the publication of the Proceedings of the Union, to have charge of all property of the Union, and to perform such other duties as properly pertain to the office.

Sec. 4. Duties of the Treasurer. It shall be the duty of the Treasurer to receive and have charge of all moneys of the Union and to pay such bills as are endorsed by the President and Secretary.

Sec. 5. Duties of the Executive Committee. It shall be the duty of the Executive Committee to fix the date and place of the annual meeting, to act on applications for membership as provided in article II, section 3, to concur in the appointment of standing committees as provided in Article IV, section 3, to fill by temporary appointment offices which shall become vacant, and to nominate three persons for each of the several offices that are to be filled annually.

ARTICLE VI. (ELECTION OF OFFICERS AND COMMITTEES)

Section 1. The election of all officers shall be by ballot, a majority of those voting being required to elect, and the Secretary shall send a list of the nominees of the Executive Committee to each member one month before the date of the annual meeting.

Sec. 2. The term of office shall extend from the end of one annual meeting to the end of the next one.

ARTICLE VII. (Meetings)

Section 1. The annual meeting of the Union shall be held at such place and time as the Executive Committee shall decide.

ARTICLE VIII. (Dues and Assessments)

Section 1. The annual dues of the members shall be two dollars ($2), due at the time of election to membership and on the date of each annual meeting thereafter.

Sec. 2. In case of failure to pay dues before the close of the year, a member shall forfeit his right to the publications of the Union.

Sec. 3. In case of failure to pay dues for two years a member shall be dropped from the roll of the Union.

ARTICLE IX. (Amendments)

Section 1. An amendment to this constitution may be adopted by an affirmative vote of two-thirds of the members present at any annual meeting, one month notice of the proposed amendment having been given all members.

BY-LAWS.

Section 1. The actual amount expended by the officers in carrying on their official duties shall be refunded to them.

Sec. 2. All members in good standing shall receive gratis one copy of the publications of the Union. Other copies of the publications may be distributed under sanction of the Executive Committee.

Sec. 3. All papers presented at the meetings shall be the property of the Union and shall be filed with the Secretary.

Sec. 4. The order of business at the annual meeting shall be as follows: 1, Reports of Officers; 2, Reports of Committees; 3, Proposal of Names and Election of Members; 4, New Business; 5, Announcement of Election of Officers and Committees; 6,

Presentation and Discussion of Papers and Remarks; 7, Installation of Officers; 8, Reading of Minutes; 9, Adjournment.

Sec. 5. Application for membership must be made to the Executive Committee, and such application must have the endorsement of at least one member in good standing, which shall be expected to be a proper recommendation of the candidate.

Sec. 6. Any of the By-Laws may be amended or repealed by vote of a majority of the members.

LIST OF MEMBERS

Corrected to January 1, 1908. Names of Charter Members indicated by an asterisk.

HONORARY MEMBERS

Miller, Dr. George L., 624 N. 19th St., Omaha..... 1901

MEMBERS

Arter, Jason, Kirkwood, Nebraska..... 1902
Barbour, Miss Carrie, Dept. Geology, Uni. of Neb., Lincoln, 1902
*Barbour, Dr. E. H., Prof. Geology, Uni. of Neb., Lincoln, 1900
Bassett, S. C., Gibbon, Nebraska..... 1901
*Bates, Rev. J. M., Red Cloud, Nebraska..... 1900
Brainerd, Miss Lida, 3214 Hamilton St., Omaha..... 1904
Bruner, H. F., Swan P. O., Holt County, Nebraska..... 1901
*Bruner, Lawrence, Prof. Entomology, Uni. of Neb., Lincoln 1900
Bruner, Miss Psyche E., 2314 S. 17th St., Lincoln..... 1903
*Caldwell, Miss Anna E., State Normal School, Kearney, 1900
*Crawford, J. C., U. S. National Museum, Division Insects, Washington, D. C..... 1900
*Dickinson, J. A., Lincoln..... 1900
Duncanson, H. B., State Normal School, Peru, Nebraska... 1901
*Eiche, August, 1133 O St., Lincoln..... 1900
Frey, C. H., 1133 O St., Lincoln..... 1901
Gifford, Dr. H., 405 Karbach Block, Omaha..... 1903
Griggs, Leland, Doane College, Crete, Nebraska..... 1907

Harper, Miss Alice, 2416 Cass St., Omaha..... 1906
Hartley, Miss Fay, Grand View, Lincoln..... 1903
*Hayward, Mrs. Mary Smith, Chadron, Nebraska..... 1900
Hitte, Miss Alice E., 102 S. 25th Ave., Omaha..... 1904
Isaacson, Miss Hulda, 30th and Seward Sts., Omaha..... 1905
Johnson, Ross F., R. F. D. No. 3, Burchard, Nebraska..... 1903
Livers, Rev. Ralph W., South Omaha, Nebraska..... 1907
Lowry, Dr. H. B., 843 S. 10th St., Lincoln..... 1901
Marshall, Miss Ruth, Dept. Zoology, Uni. of Neb., Lincoln.. 1907
McDonald, Miss Jeanette, Omaha..... 1905
Milroy, Dr W. F., 312 McCague Building, Omaha..... 1903
*Munro, Rev. G. A., Columbus, Nebraska..... 1900
Payne, Mrs. Geo. B., 3602 Lincoln Bvd., Omaha..... 1901
Peabody, Rev. P. B., Blue Rapids, Kansas..... 1904
Pollard, Hon. Isaac, Nehawka, Nebraska..... 1903
Rich, Dr. Guy C., Union Bank Building, Sioux City, Iowa.. 1902
*Sessions, L., Norfolk, Nebraska..... 1900
Sheldon, A. E., State Historical Society, Lincoln..... 1904
Sheldon, Mrs. A. E., Lincoln..... 1904
*Shoemaker, Frank H., 2960 Dewey Ave., Omaha..... 1900
Smith, Mrs. Chas. C., Exeter, Nebraska..... 1907
Smith, Harry S., Dept. Entomology, Uni. of Neb., Lincoln.. 1907
Stevens, Dr. J. F., 304-5 Funke Building, Lincoln..... 1904
*Stringer, Miss Caroline, Omaha High School, Omaha.... 1900
*Swenk, Myron H., Dept. Entomology, University of Neb. 1900
Tobitt, Miss Edith, Public Library, Omaha..... 1907
*Tout, Wilson, No. Platte High School, North Platte, Neb.. 1900
Towne, Dr. S. R., 22 Continental Block, Omaha..... 1902
*Trostler, Dr. I. S., 423 Garfield Ave., Chicago, Ill..... 1900
Van Sant, A. C., 2960 Dewey Ave., Omaha..... 1901
*Van Sant, Miss Elizabeth, 2960 Dewey Ave., Omaha..... 1900
Wallace, J. E., 609 S. 13th St., Omaha..... 1901
*Wolcott, Dr. R. H., Prof. Anatomy, Uni. of Neb., Lincoln.. 1900
Wolfe, W. E., Wray, Colorado..... 1903
Wood, Miss Emily, 2444 Templeton St., Omaha..... 1901
Zimmer, John T., 1701 L St., Lincoln..... 1907

VOL. IV, PART 2 AUGUST 25, 1909

PROCEEDINGS OF THE

NEBRASKA ORNITHOLOGISTS' UNION

AN ANALYSIS OF NEBRASKA'S BIRD FAUNA

BY ROBERT H. WOLCOTT

The number of species and subspecies of birds known to have occurred up to the present time within the limits of Nebraska is 406, which large number is due to its unusually favorable geographical location. The state lies on the border line between the humid eastern faunal areas and the arid areas of the west, and is frequented by forms characteristic of each. Its extent east and west, and the difference in elevation between the two ends of the state is sufficiently great that while the eastern end is in the Mississippi valley, and shares its faunal character, the northwest corner is fairly in the foothills of the Rocky mountains. Its latitude and the extremes of its climate are such that many southern birds reach its southern border in the summer, while the storms of winter bring to it at that season a large number of northern visitors.

It should be noted at the outset that in the meeting of eastern and western subspecies of the same species in the state there is, of course, no sharp line dividing them, but on the contrary a gradual shading of the one into the other. Intermediate specimens occur representing all shades of gradation between them. It may be that only a few of the specimens taken at the eastern end of the state represent the one, while only at the extreme west are found specimens typical of the other. But throughout this discussion the subspecies assigned to any region is that to which the majority of specimens taken there approach most closely.

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The whole number may be grouped as below, the adjectives "eastern," "western," etc., referring to the distribution of the species within the state, and those species which have actually been found breeding being marked by an asterisk. The nomenclature and the numbers prefixed to the species are according to the most recent revision of the A. O. U. check list.

I.—SPECIES FOUND IN SOME PART OF THE STATE, IN LARGER OR SMALLER NUMBERS, AT ALL SEASONS OF THE YEAR

*132. Mallard—*Anas platyrhynchos* Linn. In winter few, on open water, south.

*139. Green-winged Teal—*Nettion carolinensis* (Gmel.). In winter few, on open water, south; in summer rare breeder, north.

*143. Pintail—*Dafila acuta* (Linn.). In winter few, on open water, south.

146. Red-head—*Marila americana* (Eyt.). In winter few, on open water, south.

*172. Canada Goose—*Branta canadensis* (Linn.). On larger open bodies of water in winter.

*289. Bob-white—*Colinus virginianus* (Linn.).

*300. Ruffed Grouse—*Bonasa umbellus* (Linn.). Eastern.

*305. Prairie Chicken—*Tympanuchus americanus* (Reich.). Shows an evident movement southeastward in winter.

*308b. Prairie Sharp-tailed Grouse—*Pediocoetes phasianellus campestris* Ridgw. Western.

*309. Sage Hen—*Centrocercus urophasianus* (Bonap.). Northwestern.

*316. Mourning Dove—*Zenaidura macroura carolinensis* (Linn.). In winter in flocks, south.

*325. Turkey Vulture—*Cathartes aura septentrionalis* (Wied). Rare in winter, south.

*331. Marsh Hawk—*Circus hudsonius* (Linn.). In winter few, south.

*332. Sharp-shinned Hawk—*Accipiter velox* (Wils.). In winter occasional, south; breeding northwest.

*333. Cooper Hawk—*Accipiter cooperi* (Bonap.). In winter frequent, south.

*337. Red-tailed Hawk—*Buteo borealis* (Gmel.). Eastern.

*337a. Krider Hawk—*Buteo borealis kriderii* Hoopes. Western; eastward in winter.

337b. Western Red-tail—*Buteo borealis calurus* (Cass.). Western; eastward in winter.

*339. Red-shouldered Hawk—*Buteo lineatus* (Gmel.). Eastern; rare in winter, southeast.

*342. Swainson Hawk—*Buteo swainsoni* Bonap. Rare in winter, south.

*348. Ferruginous Rough-leg—*Archibuteo ferrugineus* (Licht.). Rather western; east in winter.

*349. Golden Eagle—*Aquila chrysaetos* (Linn.). Now western, rare; more common and eastward in winter.

352. Bald Eagle—*Haliaetus leucocephalus* (Linn.). Rare.

*355. Prairie Falcon—*Falco mexicanus* Schlegel. Western; eastward in winter.

356. Duck Hawk—*Falco peregrinus anatum* (Bonap.). Probable breeder northwest; in winter rare, southeast.

*365. Barn Owl—*Aluco pratincola* (Bonap.). Eastern.

*366. Long-eared Owl—*Asio wilsonianus* (Less.).

*367. Short-eared Owl—*Asio flammeus* (Pont.).

*368. Barred Owl—*Strix varia* Bart. Eastern.

*372. Saw-whet Owl—*Cryptoglaux acadicus* (Gmel.). Breeds only east; in winter dispersed over state.

*373. Screech Owl—*Otus asio* (Linn.).

*375. Great Horned Owl—*Bubo virginianus* (Gmel.). Eastern.

*375a. Western Horned Owl—*Bubo virginianus pallescens* Stone. Western.

*378. Burrowing Owl—*Speotyto cunicularia hypogaea* (Bonap.). Now rare eastward.

*390. Belted Kingfisher—*Ceryle alcyon* (Linn.). In winter about open water, south.

*393. Hairy Woodpecker—*Dryobates villosus* (Linn.). Eastern.

*393e. Rocky Mountain Hairy Woodpecker—*Dryobates villosus monticola* Anth. Western.

*394b. Batchelder Woodpecker—*Dryobates pubescens homorus* (Cab.). Western.

*394c. Northern Downy Woodpecker—*Dryobates pubescens medianus* (Swains.). Eastern.

*405. Northern Pileated Woodpecker—*Phloeotomus pileatus abieticola* (Bangs). Eastern. Possibly extinct.

*406. Red-headed Woodpecker—*Melanerpes erythrocephalus* (Linn.). Rare in winter, southeast.

*408. Lewis Woodpecker—*Asyndesmus lewisi* Riley. Western.

*409. Red-bellied Woodpecker—*Centrurus carolinus* (Linn.). Rare in winter, southeast.

*412a. Northern Flicker—*Colaptes auratus luteus* Bangs. More common eastward.

*413. Red-shafted Flicker—*Colaptes cafer collaris* (Vigors). More common westward.

*474b. Prairie Horned Lark—*Otocoris alpestris praticola* Hensh. Eastern.

*474c. Desert Horned Lark—*Otocoris alpestris leucolaema* (Coues). Western; eastward in winter.

*475. Magpie—*Pica pica hudsonica* (Sab.). Now western; moving eastward in winter.

*477. Blue Jay—*Cyanocitta cristata* (Linn.). More common eastward; less numerous in winter.

*488. Crow—*Corvus brachyrhynchos* Brehm. Rare westward.

*492. Pinion Jay—*Cyanocephalus cyanocephalus* (Wied). Western; moving eastward in winter.

*501.1. Western Meadowlark—*Sturnella neglecta* Aud. Few in winter, south.

*511b. Bronzed Grackle—*Quiscalus quiscula aeneus* (Ridg.). In winter few, south.

521. Red Crossbill—*Loxia curvirostra minor* (Brehm). Present in summer in the Pine ridge; in winter dispersed over state.

*529. Goldfinch—*Astragalinus tristis* (Linn.). Eastern.

529a. Western Goldfinch—*Astragalinus tristis pallidus* Mearns. Western.

533. Pine Siskin—*Spinus pinus* (Wils.). Probably breeds northwest.

*566. White-winged Junco—*Junco aikeni* Ridg. Northwestern.

581. Song Sparrow—*Melospiza melodia* (Wils.). In winter, south; rare in summer, north. Most of our winter birds are the Dakota Song Sparrow.

*587. Towhee—*Pipilo erythrophthalmus* Linn. Eastern. In winter rare, southeast.

*588. Arctic Towhee—*Pipilo maculatus arcticus* (Swain.). Western, eastward in migrations. In winter rare, southeast.

*593. Cardinal—*Cardinalis cardinalis* (Linn.). Southeastern.

*619. Cedar Waxwing—*Bombycilla cedrorum* Vieill. Rare breeder, north; few in winter, south.

*726. Brown Creeper—*Certhia familiaris americana* (Bonap.). Eastern. Rare in summer; in winter, common only southeast.

*727. White-bellied Nuthatch—*Sitta carolinensis* Lath. Eastern.

*727c. Rocky Mountain Nuthatch—*Sitta carolinensis nelsoni* Mearns. Western.

731. Tufted Titmouse—*Baeolophus bicolor* (Linn.). Eastern.

*735. Eastern Chickadee—*Penthestes atricapillus* (Linn.). Rare, east.

*735a. Long-tailed Chickadee—*Penthestes atricapillus septentrionalis* (Harris).

*754. Townsend Solitaire—*Myadestes townsendii* (Aud.). Northwest; in winter southeastward.

*761. Robin—*Planesticus migratorius* (Linn.). Few in winter, southeast.

*766. Bluebird—*Sialia sialis* (Linn.). In winter rare, southeast.

II.—Species migrant in spring and fall and which remain in larger or smaller numbers to breed in the state; and also summer visitors which are stragglers and do not breed here

*3. Horned Grebe—*Colymbus auritus* Linn. Not common.
*4. Eared Grebe—*Colymbus nigricollis californicus* (Heerm.).
*6. Pied-billed Grebe—*Podilymbus podiceps* (Linn.).
58. Laughing Gull—*Larus atricilla* Linn. Summer straggler from the south.
*69. Forster Tern—*Sterna forsteri* Nutt.
*74. Least Tern—*Sterna antillarum* Less.
*77. Black Tern—*Hydrochelidon nigra surinamensis* (Gmel.).
*131. Hooded Merganser—*Lophodytes cucullatus* (Linn.).
*135. Gadwall—*Chaulelasmus streperus* (Linn.).
137. Widgeon—*Mareca americana* (Gmel.).
*140. Blue-winged Teal—*Querquedula discors* (Linn.).
*142. Shoveller—*Spatula clypeata* (Linn.).
*144. Wood Duck—*Aix sponsa* (Linn.). Eastern.
*147. Canvasback—*Marila vallisneria* (Wils.).
150. Ring-necked Duck—*Marila collaris* (Donov.).
*167. Ruddy Duck—*Erismatura jamaicensis* (Gmel.).
*181. Trumpeter Swan—*Olor buccinator* (Rich.). Now rare breeder.
186. Glossy Ibis—*Plegadis autumnalis* (Hass.). Straggler from the southeast.
187. White-faced Glossy Ibis—*Plegadis guarauna* (Linn.). Straggler from the southwest.
*190. Bittern—*Botaurus lentiginosus* (Mont.).
*191. Least Bittern—*Ixobrychus exilis* (Gmel.). Eastern.
*194. Great Blue Heron—*Ardea herodias* Linn.
196. Egret—*Herodias egretta* Gmel. Straggler from the south.
*197. Snowy Egret—*Egretta candidissima* Gmel. Rare.
200. Little Blue Heron—*Florida caerulea* Linn. Straggler from the south.
*201. Green Heron—*Butorides virescens* Linn. Eastern.
*202. Black-crowned Night Heron—*Nycticorax nycticorax naevius* (Bodd.).
203. Yellow-crowned Night Heron—*Nyctanassa violacea* (Linn.). Rare straggler from the south.
*206. Sandhill Crane—*Grus mexicana* (Muell.).
*208. King Rail—*Rallus elegans* Aud. Eastern.
*212. Virginia Rail—*Rallus virginianus* Linn. Eastern.
*214. Sora—*Porzana carolina* (Linn.). Eastern.
216. Black Rail—*Creciscus jamaicensis* (Gmel.). Rare.
218. Purple Gallinule—*Ionornis martinica* (Linn.). Straggler from southeast.

*219. Florida Gallinule—*Gallinula galatea* (Licht.). Eastern.
*221. Coot—*Fulica americana* Gmel.
*224. Wilson Phalarope—*Steganopus tricolor* (Vieill.).
*225. Avocet—*Recurvirostra americana* Gmel.
226. Black-necked Stilt—*Himantopus mexicanus* (Muell.). Straggler from the south.
*228. Woodcock—*Philohela minor* (Gmel.). Eastern. Rare.
249. Marbled Godwit—*Limosa fedoa* (Linn.).
254. Greater Yellow-legs—*Totanus melanoleucus* (Gmel.).
*256. Solitary Sandpiper—*Helodromas solitarius* (Wils.). Rare breeder. north.
*258a. Western Willet—*Catoptrophorus semipalmatus inornatus* (Brewst.).
*261. Upland Plover—*Bartramia longicauda* (Bechst.).
*263. Spotted Sandpiper—*Actitis macularia* (Linn.).
*264. Long-billed Curlew—*Numenius americanus* Bechst.
*273. Killdeer—*Oxyechus vociferus* (Linn.).
*277. Piping Plover—*Aegialitis meloda* (Ord).
281. Mountain Plover—*Podasocys montanus* (Towns.). Western.
326. Black Vulture—*Catharista urubu* (Vieill.). Straggler from the south.
*327. Swallow-tailed Kite—*Elanoides forficatus* (Linn.). Eastern. Rare.
337d. Harlan Hawk—*Buteo borealis harlani* (Aud.). Straggler from the southwest.
*343. Broad-winged Hawk—*Buteo platypterus* (Vieill.). Eastern.
357b. Richardson Pigeon Hawk—*Falco columbarius richardsonii* (Ridg.). Rare now.
*360. Sparrow Hawk—*Falco sparverius* Linn.
360a. Desert Sparrow Hawk—*Falco sparverius phalaena* Less. Western; straggling eastward in migrations.
*364. Osprey—*Pandion haliaetus carolinensis* (Gmel.). Eastern.
*387. Yellow-billed Cuckoo—*Coccyzus americanus* (Linn.). Eastern.
*388. Black-billed Cuckoo—*Coccyzus erythrophthalmus* (Wils.).
402. Yellow-bellied Sapsucker—*Sphyrapicus varius* (Linn.). Eastern.
*417. Whip-poor-will—*Antrostomus vociferus* (Wils.). Eastern.
*418. Poorwill—*Phalaenoptilus nuttallii* (Aud.). Western.
*420. Nighthawk—*Chordeiles virginianus* (Gmel.). Eastern.
*420a. Western Nighthawk—*Chordeiles virginianus henryi* (Cass.). Western.
*420c. Sennett Nighthawk—*Chordeiles virginianus sennetti* (Coues). Western. Eastward in migrations.
*423. Chimney Swift—*Chaetura pelagica* (Linn.). Eastern.
*425. White-throated Rock Swift—*Aeronautes melanoleucus* (Bd.). Western.
*428. Ruby-throated Hummingbird—*Archilochus colubris* (Linn.). Eastern.

432. Broad-tailed Hummingbird—*Selasphorus platycercus* (Swain.). Western.
443. Scissor-tailed Flycatcher—*Muscivora forficata* (Gmel.). Straggler from the south.
*444. Kingbird—*Tyrannus tyrannus* (Linn.).
*447. Arkansas Kingbird—*Tyrannus verticalis* Say. Western, rare breeder eastward; more common eastward in migrations.
*452. Great-crested Flycatcher—*Myiarchus crinitus* (Linn.). Eastern.
*456. Phoebe—*Sayornis phoebe* (Lath.). Eastern.
*457. Say Phoebe—*Sayornis saya* (Bonap.). Western.
*461. Wood Pewee—*Myiochanes virens* (Linn.). Eastern.
462. Western Wood Pewee—*Myiochanes richardsonii* (Swain.). Western.
*465. Acadian Flycatcher—*Empidonax virescens* (Vieill.). Eastern; but taken once as straggler in Pine ridge.
*466. Traill Flycatcher—*Empidonax traillii* (Aud.).
466a. Alder Flycatcher—*Empidonax traillii alnorum* Brewst. Probably breeds in northwest; migrant in state eastward.
*467. Least Flycatcher—*Empidonax minimus* Bd. Eastern.
*494. Bobolink—*Dolichonyx oryzivorus* (Linn.). Eastern.
*495. Cowbird—*Molothrus ater* (Bodd.).
*497. Yellow - headed Blackbird — *Xanthocephalus xanthocephalus* (Bonap.). As a breeder more common westward.
*498. Red-winged Blackbird—*Agelaius phoeniceus* (Linn.).
*501. Meadowlark—*Sturnella magna* (Linn.). Rare. Local race breeding about Cherry county lakes.
*506. Orchard Oriole—*Icterus spurius* (Linn.). Eastern.
*507. Baltimore Oriole—*Icterus galbula* (Linn.). Eastern.
*508. Bullock Oriole—*Icterus bullocki* (Swains.). Western.
*510. Brewer Blackbird—*Euphagus cyanocephalus* (Wagl.). Breeding northward and westward.
*538. Chestnut-collared Longspur—*Calcarius ornatus* (Towns.). Breeding northward.
*539. McCown Longspur—*Rhyncophanes mccownii* (Lawr.). Western.
*540. Vesper Sparrow—*Pooecetes gramineus* (Gmel.). Eastern.
*540a. Western Vesper Sparrow—*Pooecetes gramineus confinis* Bd. Western.
546. Grasshopper Sparrow—*Ammodramus savannarum australis* Mayn. Straggler along eastern border of state.
*546a. Western Grasshopper Sparrow—*Ammodramus savannarum bimaculatus* Swain.
*547a. Western Henslow Sparrow—*Passerherbulus henslowii occidentalis* (Brewst.). Eastern.
*552. Lark Sparrow—*Chondestes grammacus* (Say). Eastern.
*552a. Western Lark Sparrow—*Chondestes grammacus strigatus* (Swain.). Western.

*560. Chipping Sparrow—*Spizella passerina* (Bechst.). Eastern.
*560a. Western Chipping Sparrow—*Spizella passerina arizonae* Coues. Western.
*561. Clay-colored Sparrow—*Spizella pallida* (Swain.). Rare breeder northward.
*562. Brewer Sparrow—*Spizella breweri* Cass. Breeder in northwest.
*563. Field Sparrow—*Spizella pusilla* (Wils.). Eastern.
*563a. Western Field Sparrow—*Spizella pusilla arenacea* Chad. Western.
*584. Swamp Sparrow—*Melospiza georgiana* (Lath.). Eastern.
*595. Rose-breasted Grosbeak—*Zamelodia ludoviciana* (Linn.). Eastern.
*596. Black-headed Grosbeak—*Zamelodia melanocephala* (Swain.). Western.
*597a. Western Blue Grosbeak—*Guiraca caerulea lazula* (Less.).
*598. Indigo Bunting—*Passerina cyanea* (Linn.). Eastern.
*599. Lazuli Bunting—*Passerina amoena* (Say). Western.
*604. Dickcissel—*Spiza americana* (Gmel.).
*605. Lark Bunting—*Calamospiza melanocorys* Stejn. Rare eastward.
*607. Western Tanager—*Piranga ludoviciana* (Wils.). Western.
*608. Scarlet Tanager—*Piranga erythromelas* Vieill. Eastern.
*610. Summer Tanager—*Piranga rubra* (Linn.). Rare; southeastern.
*611. Purple Martin—*Progne subis* (Linn.). Eastern.
*612. Cliff Swallow—*Petrochelidon lunifrons* (Say).
*613. Barn Swallow—*Hirundo erythrogastra* Bodd.
*614. Tree Swallow—*Iridoprocne bicolor* (Vieill.). Breeds northward.
*615. Violet-green Swallow—*Tachycineta thalessina lepida* (Mearns). Western.
*616. Bank Swallow—*Riparia riparia* (Linn.).
*617. Rough-winged Swallow—*Stelgidopteryx serripennis* (Aud.). Eastern.
*622a. White-rumped Shrike—*Lanius ludovicianus excubitorides* (Swain.).
622e. Migrant Shrike—*Lanius ludovicianus migrans* Palmer. Eastern.
*624. Red-eyed Vireo—*Vireosylva olivacea* (Linn.).
*627. Warbling Vireo—*Vireosylva gilva* (Vieill.). Eastern.
*627a. Western Warbling Vireo—*Vireosylva gilva swainsoni* (Bd.). Western.
*628. Yellow-throated Vireo—*Lanivireo flavifrons* (Vieill.). Eastern.
*629b. Plumbeous Vireo—*Lanivireo solitarius plumbeus* (Coues). Breeding in northwest.
630. Black-capped Vireo—*Vireo atricapillus* Woodh. Straggler from southwest.
*631. White-eyed Vireo—*Vireo noveboracensis* (Gmel.). Eastern.
*633. Bell Vireo—*Vireo bellii* Aud. Eastern.
*636. Black and White Warbler—*Mniotilta varia* (Linn.). Eastern.
*637. Prothonotary Warbler—*Protonotaria citrea* (Bodd.). Eastern.
639. Worm-eating Warbler—*Helmitheros vermivorus* (Gmel.). Eastern.

*641. Blue-winged Warbler—*Vermivora pinus* (Linn.). Eastern.
*645. Nashville Warbler—*Vermivora rubricapilla* (Wils.). Eastern.
648a. Northern Parula Warbler—*Compsothlypis americana usneae* Brewst. Eastern.
*652. Yellow Warbler—*Dendroica aestiva* (Gmel.).
*656. Audubon Warbler—*Dendroica auduboni* (Towns.). Western.
*658. Caerulean Warbler—*Dendroica caerulea* (Wils.). Eastern.
*659. Chestnut-sided Warbler—*Dendroica pennsylvanica* (Linn.). Eastern.
663a. Sycamore Warbler—*Dendroica dominica albilora* Ridg. Straggler from the south to the southeastern part of the state.
*673. Prairie Warbler—*Dendroica discolor* (Vieill.). Eastern.
*674. Ovenbird—*Seiurus aurocapillus* (Linn.).
*675a. Grinnell Water-thrush—*Seiurus noveboracensis notabilis* Ridg. Breeds northwestward.
*676. Louisiana Water-thrush—*Seiurus motacilla* (Vieill.). Eastern.
*677. Kentucky Warbler—*Oporornis formosa* (Wils.). Eastern.
[*679. Mourning Warbler—*Oporornis philadelphia* (Wils.). Eastern. Breeding reported but once and the occurrence, if true, no doubt accidental.]
680. MacGillivray Warbler—*Oporornis tolmiei* (Towns.). Western.
*681. Yellowthroat—*Geothlypis trichas* (Linn.). Eastern.
*681a. Western Yellowthroat—*Geothlypis trichas occidentalis* Brewst. Western.
*683. Yellow-breasted Chat—*Icteria virens* (Linn.). Eastern.
*683a. Long-tailed Chat—*Icteria virens longicauda* (Lawr.). Western.
684. Hooded Warbler—*Wilsonia citrina* (Bodd.). Eastern. Rare.
*687. Redstart—*Setophaga ruticilla* (Linn.).
701. Dipper—*Cinclus mexicanus unicolor* (Bonap.). Straggler from west to western Nebraska.
702. Sage Thrasher—*Oroscoptes montanus* (Towns.). Summer resident in northwest.
*703. Mockingbird—*Mimus polyglottos* (Linn.). Eastern.
*703a. Western Mockingbird—*Mimus polyglottos leucopterus* (Vig.). Western.
*704. Catbird—*Dumetella carolinensis* (Linn.).
*705. Brown Thrasher—*Toxostoma rufum* (Linn.).
*715. Rock Wren—*Salpinctes obsoletus* (Say). Western.
718. Carolina Wren—*Thryothorus ludovicianus* (Lath.). Rare; southeastern.
*719. Bewick Wren—*Thryomanes bewickii* (Aud.). Southeastern; rare.
*721a. Western House Wren—*Troglodytes aedon parkmanii* Aud.
*724. Short-billed Marsh Wren—*Cistothorus stellaris* (Licht.). Eastern.
*725d. Long-billed Marsh Wren—*Telmatodytes palustris iliacus* Ridg.
*751. Blue-gray Gnatcatcher—*Polioptila caerulea* (Linn.). Eastern.
*755. Wood Thrush—*Hylocichla mustelina* (Gmel.).

758a. Olive-backed Thrush—*Hylocichla ustulata swainsonii* (Cab.). In Pine ridge canyons in summer.

*761a. Western Robin—*Planesticus migratorius propinqua* (Ridg.). Western.

*768. Mountain Bluebird—*Sialia currucoides* (Bechst.). Western.

III.—SPECIES OCCURRING IN THE STATE ONLY IN SPRING AND FALL MIGRATIONS AND BREEDING NOT PROBABLE, THOUGH INDIVIDUALS MAY BE SEEN IN SUMMER, PRESUMABLY BIRDS THAT HAVE FALLEN OUT IN MIGRATION FROM SOME CAUSE, AS PERHAPS, IN THE CASE OF SHORE BIRDS AND DUCKS, INJURY BY SHOT WOUNDS. SOME OF THEM MAY REMAIN IN THE WINTER DURING MILD WEATHER

1. Western Grebe—*Aechmophorus occidentalis* Lawr. Straggler from the west.
7. Loon—*Gavia immer* (Brünn.).
36. Pomarine Jaeger—*Stercorarius pomarinus* (Temm.). Rare.
37. Parasitic Jaeger—*Stercorarius parasiticus* (Linn.). Rare.
51. Herring Gull—*Larus argentatus* Pont.
54. Ring-billed Gull—*Larus delawarensis* Ord. A possible breeder northward in the sand hills.
59. Franklin Gull—*Larus franklinii* Swain. & Rich.
60. Bonaparte Gull—*Larus philadelphia* (Ord).
64. Caspian Tern—*Sterna caspia* Pall.
70. Common Tern—*Sterna hirundo* Linn.
120. Double-crested Cormorant—*Phalacrocorax auritus* (Less.).
125. White Pelican—*Pelecanus erythrorhynchos* Gmel. May have once bred.
126. Brown Pelican—*Pelecanus occidentalis* (Linn.). A straggler only.
129. Merganser—*Mergus americanus* Cass. May winter.
130. Red-breasted Merganser—*Mergus serrator* Linn. May winter.
133. Red-legged Black Duck—*Anas rubripes* Brewst.
133a. Black Duck—*Anas rubripes tristis* Brewst. A possible breeder.
136. European Widgeon—*Mareca penelope* (Linn.). Accidental.
141. Cinnamon Teal—*Querquedula cyanoptera* (Vieill.). Rare; more common westward.
148. Scaup—*Marila marila* (Linn.).
149. Lesser Scaup—*Marila affinis* (Eyt.). A possible breeder in the sand hills, northward.
153. Buffle-head—*Charitonetta albeola* (Linn.). May winter.
169. Snow Goose—*Chen hyperborea* (Pall.).
169a. Greater Snow Goose—*Chen hyperborea nivalis* (Forst.).
169.1. Blue Goose—*Chen caerulescens* (Linn.).

171a. White-fronted Goose—*Anser albifrons gambeli* (Hartl.).
172a. Hutchins Goose—*Branta canadensis hutchinsii* (Rich.). May winter.
172c. Cackling Goose—*Branta canadensis minima* Ridg.
173a. Brant—*Branta bernicla glaucogastra* (Brehm). A straggler.
180. Whistling Swan—*Olor columbianus* (Ord).
204. Whooping Crane—*Grus americana* (Linn.). May have once bred.
205. Little Brown Crane—*Grus canadensis* (Linn.).
215. Yellow Rail—*Coturnicops noveboracensis* (Gmel.). Eastern.
223. Northern Phalarope—*Lobipes lobatus* (Linn.).
230. Jack Snipe—*Gallinago delicata* (Ord). Winters regularly in small numbers about springs and spring-fed bogs. Has been seen during the summer, north.
231. Dowitcher—*Macrorhamphus griseus* (Gmel.).
232. Long-billed Dowitcher—*Macrorhamphus scolopaceus* (Say).
233. Stilt Sandpiper—*Micropalama himantopus* (Bonap.).
234. Knot—*Tringa canutus* Linn.
239. Pectoral Sandpiper—*Pisobia maculata* (Vieill.).
240. White-rumped Sandpiper—*Pisobia fuscicollis* (Vieill.).
241. Baird Sandpiper—*Pisobia bairdii* (Coues). Has been seen during the summer.
242. Least Sandpiper—*Pisobia minutilla* (Vieill.). A possible rare breeder, north.
243a. Red-backed Sandpiper—*Pelidna alpina sakhalina* (Vieill.).
246. Semipalmated Sandpiper—*Ereunetes pusillus* (Linn.). Has been taken during the summer.
248. Sanderling—*Calidris leucophaea* (Pall.).
251. Hudsonian Godwit—*Limosa haemastica* (Linn.).
255. Yellow-legs—*Totanus flavipes* (Gmel.). Has been seen in summer.
262. Buff-breasted Sandpiper—*Tryngites subruficollis* (Vieill.). Has been taken in summer.
265. Hudsonian Curlew—*Numenius hudsonicus* Lath.
266. Eskimo Curlew—*Numenius borealis* (Forst.).
270. Black-bellied Plover—*Squatarola squatarola* (Linn.).
272. Golden Plover—*Charadrius dominicus* Muell.
274. Semipalmated Plover—*Aegialitis semipalmata* Bonap.
278. Snowy Plover—*Aegialitis nivosa* Cass. Straggler from west.
283a. Ruddy Turnstone—*Arenaria interpres morinella* (Linn.).
357. Pigeon Hawk—*Falco columbarius* Linn. A few winter.
459. Olive-sided Flycatcher—*Nuttallornis borealis* (Swain.).
463. Yellow-bellied Flycatcher—*Empidonax flaviventris* Bd. Eastern.
498d. Northern Redwing—*Agelaius phoeniceus fortis* Ridg. Frequently winters.
509. Rusty Blackbird—*Euphagus carolinus* (Muell.). Occasionally winters.

517. Purple Finch—*Carpodacus purpureus* (Gmel.). Rarely winters.
537. Painted Longspur—*Calcarius pictus* (Swain.).
542a. Savannah Sparrow—*Passerculus sandwichensis savanna* (Wils.). Eastern.
542b. Western Savanna Sparrow—*Passerculus sandwichensis alaudinus* (Bonap.). A possible breeder northwestward.
545. Baird Sparrow—*Ammodramus bairdii* (Aud.).
548. Leconte Sparrow—*Passerherbulus leconteii* (Aud.).
549.1. Nelson Sparrow—*Passerherbulus nelsoni* (Allen).
553. Harris Sparrow—*Zonotrichia querula* (Nutt.). Winters commonly south.
554. White-crowned Sparrow—*Zonotrichia leucophrys* (Forst.).
554a. Intermediate Sparrow—*Zonotrichia leucophrys gambelii* (Nutt.).
558. White-throated Sparrow—*Zonotrichia albicollis* (Gmel.). Eastern.
581j. Dakota Song Sparrow—*Melospiza melodia juddi* (Bishop). Winters.
583. Lincoln Sparrow—*Melospiza lincolnii* (Aud.).
585. Fox Sparrow—*Passerella iliaca* (Merr.). Eastern. Rarely winters.
585c. Slate-colored Fox Sparrow—*Passerella iliaca schistacea* (Bd.). Western.
626. Philadelphia Vireo—*Vireosylva philadelphia* Cass. Eastern.
629. Blue-headed Vireo—*Lanivireo solitarius* (Wils.). Eastern.
638. Swainson Warbler—*Helinaia swainsonii* Aud. Straggler from southeast, once recorded.
642. Golden-winged Warbler—*Vermivora chrysoptera* (Linn.). Eastern.
644. Virginia Warbler—*Vermivora virginiae* (Bd.). Straggler from southwest.
646. Orange-crowned Warbler—*Vermivora celata* (Say).
647. Tennessee Warbler—*Vermivora peregrina* (Wils.). Eastern.
650. Cape May Warbler—*Dendroica tigrina* (Gmel.). Eastern.
654. Black-throated Blue Warbler—*Dendroica caerulescens* (Gmel.). Eastern.
655. Myrtle Warbler—*Dendroica coronata* (Linn.).
657. Magnolia Warbler—*Dendroica magnolia* (Wils.). Eastern.
660. Bay-breasted Warbler—*Dendroica castanea* (Wils.). Eastern.
661. Black-poll Warbler—*Dendroica striata* (Forst.). Eastern.
662. Blackburnian Warbler—*Dendroica fusca* (Muell.) Eastern.
667. Black-throated Green Warbler—*Dendroica virens* (Gmel.). Eastern.
671. Pine Warbler—*Dendroica vigorsii* (Aud.). A possible breeder. Eastern.
672. Palm Warbler—*Dendroica palmarum* (Gmel.). Eastern.
679. Mourning Warbler—*Oporornis philadelphia* (Wils.). Eastern.

685. Wilson Warbler—*Wilsonia pusilla* (Wils.). Eastern.
685a. Pileolated Warbler—*Wilsonia pusilla pileolata* (Pall.). Western.
686. Canadian Warbler—*Wilsonia canadensis* (Linn.). Eastern.
697. Pipit—*Anthus rubescens* (Turn.).
700. Sprague Pipit—*Anthus spragueii* (Aud.).
748. Golden-crowned Kinglet—*Regulus satrapa* Licht. Rarely winters.
749. Ruby-crowned Kinglet—*Regulus calendula* (Linn.). Rarely winters.
756a. Willow Thrush—*Hylocichla fuscescens salicicola* Ridg.
757. Gray-cheeked Thrush—*Hylocichla aliciae* (Bd.). Eastern.
759a. Audubon Hermit Thrush—*Hylocichla guttata auduboni* (Bd.).
759b. Hermit Thrush—*Hylocichla guttata pallasii* (Cab.). Eastern.
767a. Chestnut-backed Bluebird—*Sialia mexicana bairdi* Ridg. Straggler from the west.

IV.—Winter visitors to the state

2. Holboell Grebe—*Colymbus holboellii* (Reinh.).
9. Black-throated Loon—*Gavia arcticus* (Linn.). Straggler. One record.
11. Red-throated Loon—*Gavia stellata* (Pont.). Rare. Two records.
43. Iceland Gull—*Larus leucopterus* Faber. Straggler. One record.
47. Great Black-backed Gull—*Larus marinus* Linn. Straggler. One record.
62. Sabine Gull—*Xema sabinii* (Sab.).
151. Golden-eye—*Clangula clangula americana* (Bonap.).
152. Rocky Mountain Golden-eye—*Clangula islandica* (Gmel.).
154. Old Squaw—*Harelda hyemalis* (Linn.).
155. Harlequin Duck—*Histrionicus histrionicus* (Linn.).
163. Scoter—*Oidemia americana* Swain.
165. White-winged Scoter—*Oidemia deglandi* Bonap.
166. Surf Scoter—*Oidemia perspicillata* (Linn.).
334. Goshawk—*Aster atricapillus* (Wils.).
347a. Rough-leg—*Archibuteo lagopus sancti-johannis* (Gmel.).
370. Great Gray Owl—*Scotiaptex nebulosa* (Gmel.). Straggler. One definite record.
371. Richardson Owl—*Cryptoglaux funerea richardsoni* (Bonap.). Straggler. Two records.
375b. Arctic Horned Owl—*Bubo virginianus subarcticus* (Hoy). Straggler. Two records.
376. Snowy Owl—*Nyctea nyctea* (Linn.).
377a. Hawk Owl—*Surnia ulula caparoch* (Muell.). Straggler. One record.
400. Arctic Three-toed Woodpecker—*Picoides arcticus* (Swain.). Rare.
474. Horned Lark—*Otocoris alpestris* (Linn.). Eastern.

474k. Hoyt Horned Lark—*Otocoris alpestris hoyti* Bishop.
478c. Black-headed Jay—*Cyanocitta stelleri annectens* (Bd.). Straggler from the west. One record.
484. Canada Jay—*Perisoreus canadensis* (Linn.). Straggler. One record.
484a. Rocky Mountain Jay—*Perisoreus canadensis capitalis* Ridg. Northwest.
491. Clark Nutcracker—*Nucifraga columbiana* (Wils.). A possible breeder in the northwest. Southward and eastward in winter.
514. Evening Grosbeak—*Hesperiphona vespertina* (Coop.).
515. Pine Grosbeak—*Pinicola enucleator leucura* (Muell.).
521a. Mexican Crossbill—*Loxia curvirostra stricklandi* Ridg.
522. White-winged Crossbill—*Loxia leucoptera* Gmel.
524. Gray-crowned Rosy Finch—*Leucosticte tephracotis* Swain. Western, straggling eastward.
528. Redpoll—*Acanthis linaria* (Linn.).
534. Snow Bunting—*Plectrophenax nivalis* (Linn.).
536. Lapland Longspur—*Calcarius lapponcus* (Linn.).
536a. Alaska Longspur—*Calcarius lapponicus alascensis* Ridg. Western.
559. Tree Sparrow—*Spizella monticola* (Gmel.). Eastern.
559a. Western Tree Sparrow—*Spizella monticola ochracea* Brewst.
567. Slate-colored Junco—*Junco hyemalis* (Linn.).
567b. Shufeldt Junco—*Junco hyemalis shufeldti* Coale. Straggler from west.
618. Bohemian Waxwing—*Bombycilla garrula* (Linn.).
621. Northern Shrike—*Lanius borealis* Vieill.
722. Winter Wren—*Nannus hiemalis* (Vieill.). Eastern.
726b. Rocky Mountain Creeper—*Certhia familiaris montana* Ridg. Northwest.
728. Red-bellied Nuthatch—*Sitta canadensis* Linn.
730. Pygmy Nuthatch—*Sitta pygmaea* Vigors. Northwestern.

V.—Species now extinct within the limits of Nebraska

307. Lesser Prairie Hen—*Tympanuchus pallidicinctus* Ridg. Now found in southwestern U. S. Not seen in Nebraska since the early seventies.
*310. Wild Turkey—*Meleagris gallopavo silvestris* (Vieill.). Formerly eastern.
315. Passenger Pigeon—*Ectopistes migratorius* (Linn.).
*382. Carolina Paroquet—*Conuropsis carolinensis* (Linn.) Formerly southeastern.
486. Western Raven—*Corvus corax sinuatus* (Wagl.).
487. White-necked Raven—*Corvus cryptoleucus* Couch. Western.

VI.—Introduced species

——— Ring-necked Pheasant—*Phasianus torquatus* Gmel. Southeastern.
——— English Sparrow—*Passer domesticus* (Linn.).

The distribution of Nebraska birds through the year may, then, be summarized as follows:

Found within the state during the whole year	72
Found in migrations and during the summer	174
Found during spring and fall migrations, in certain cases accidental in summer, and in others possibly wintering	106
Winter birds, possibly in some cases coming early in fall and in others lingering late in spring	46
Birds now extinct within the limits of the state	6
Introduced species, which have gained a foothold	2
	406
Birds concerning the breeding of which within the state we have definite positive evidence	205
Birds, not known to be extinct, which have been taken in mid-summer	257
Birds, not known to be extinct, which have been taken during mid-winter	132

II

It is interesting and not without significance to compare the number of forms included in the Nebraska fauna with the total number recognized in the A. O. U. check list, according to the latest revision (July, 1909), introduced species being excluded.

	N. AM.	NEBR.	PER CENT
Pygopodes (Divers)	36	8	22
Longipennes (Gulls, Terns)	50	15	30
Tubinares (Albatrosses, Shearwaters, Petrels)	41	—	—
Steganopodes (Cormorants, Pelicans, etc.)	25	3	12
Anseres (Ducks, Geese, Swans)	65	39	60
Odontoglossae (Flamingos)	1	—	—
Herodiones (Ibises, Herons)	26	11	42
Paludicolae (Cranes, Rails, etc.)	24	11	46
Limicolae (Shore birds)	77	37	48
Gallinae (Pheasants, Grouse, etc.)	53	7	13
Columbae (Doves, Pigeons)	17	2	12
Raptores (Hawks, Owls, etc.)	100	39	39
Psittaci (Parrots)	2	1	50

	N. AM.	NEBR.	PER CENT
Coccyges (Cuckoos, Kingfishers, etc.)	13	3	23
Pici (Woodpeckers)	47	12	26
Macrochires (Goatsuckers, Swifts, Hummingbirds)	35	9	26
Passeres (Flycatchers and song birds)	595	207	35
Total	1207	404	33.5
Water birds	345	124	36

Some of the larger passerine families furnish the following figures:

	A. O. U.	NEBR.	PER CENT
Tyrannidae (Flycatchers)	36	14	39
Alaudidae (Horned Larks)	15	4	27
Corvidae (Crows, Jays, etc.)	39	10	26
Icteridae (Blackbirds, Orioles, etc.)	34	13	38
Fringillidae (Sparrows, Finches, etc.)	191	60	31.5
Hirundinidae (Swallows)	17	7	41
Vireonidae (Vireos)	25	10	40
Mniotiltidae (Wood Warblers)	74	42	57
Troglodytidae (Wrens)	34	7	21
Mimidae (Mockingbirds and Thrashers)	15	5	33
Paridae (Titmice)	24	3	12
Turdidae (Thrushes)	30	12	40

A comparison of the percentage composition of the bird fauna of North America and Nebraska develops the same facts that are brought out above.

	N. AM. PER CENT	NEB. PER CENT
Pygopodes	3.0	2.0
Longipennes	4.1	3.7
Tubinares	3.4	—
Steganopodes	2.0	0.7
Anseres	5.4	9.6
Odontoglossae	0.8	—
Herodiones	2.1	2.7
Paludicolae	2.0	2.7
Limicolae	6.4	9.2
Water birds	28.6	30.7
Gallinae	4.4	1.7
Columbae	1.4	0.5
Raptores	8.3	9.6
Psittaci	0.2	0.25
Coccyges	1.1	0.7

	N. AM. PER CENT	NEB. PER CENT
Pici	3.9	3.0
Macrochires	2.9	2.2
Passeres	49.3	51.2
	100.7	99.75

Passerine families:

Tyrannidae	3.0	3.5
Alaudidae	1.2	1.0
Corvidae	3.2	2.5
Icteridae	2.8	3.2
Fringillidae	15.8	14.9
Hirundinidae	1.4	1.7
Vireonidae	2.0	2.5
Mniotiltidae	6.1	10.4
Troglodytidae	2.8	1.7
Mimidae	1.2	1.2
Paridae	2.0	0.7
Turdidae	2.5	3.0

Certain facts developed by these figures might reasonably have been inferred; others, however, are not exactly what would have been expected.

Excluding the Odontoglossae and the Psittaci, where the numbers are so small as to permit of the drawing of no conclusions, Nebraska has less than its share of Pygopodes, Tubinares, and Steganopodes, which are in part or all marine; of Columbae, Coccyges, and Macrochires, which are of more southern distribution; and of Gallinae and Pici, which seem to be rather localized in distribution and tending to break up into more numerous local forms to the south and west. On the other hand, the state has a relatively large number of Anseres, Paludicolae, and Limicolae, due to its position in the Mississippi valley, the great highway for such birds in migration, and of Herodiones, which show a tendency to straggle northward in summer along this same pathway. Water birds, as a group, are relatively numerous in the state, also, because of the general evenness of its surface over the greater part of its extent and the number of ponds and sloughs which dot its surface. The Raptores are numerous because of the abundance of food, the sparse population of certain portions of the state, and

also because the geographical location of Nebraska is such as to bring to its borders forms from both east and west.

The families of Passeres show some striking contrasts. Tyrannidae, Icteridae, Hirundinidae, Vireonidae, Mniotiltidae, and Turdidae are relatively numerous. This may be explained in the case of the Hirundinidae by the fact that the forms do not show a tendency to break up into subspecies and are of wide distribution; in the case of the Mniotiltidae by this fact and also by the fact that in the relatively few cases where subspecies occur, Nebraska receives its share of both eastern and western forms; and in the case of the other families by the occurrence of both eastern and western subspecies.

Nebraska is relatively deficient in Fringillidae, which seems particularly surprising, and in Alaudidae, Corvidae, Troglodytidae, Mimidae, and Paridae. The family Troglodytidae reaches its highest development in tropical America, and the species increase rapidly in number as we go southward. The others show a strong tendency to the formation of local races, more numerous west and south, and in the case of the Corvidae, and especially the Paridae, this is accompanied with a minimum tendency toward migration.

III

If for the purposes of further analysis we limit our discussion to those birds which make their home in Nebraska we shall deal with only 232 species and subspecies, including all those listed above as residents, those summer birds which can in no sense be considered stragglers, and species which formerly bred but are now extinct. It is interesting to observe in what direction from Nebraska lie the centers of distribution of these forms during their breeding season. In the compilation of these lists we have depended upon the last edition of Coues' Key (1903) and the four volumes, now published, of Ridgway's Birds of North and Middle America. Of these birds the following are of general distribution in North America:

6.	Pied-billed Grebe.	142.	Shoveller.
69.	Forster Tern.	144.	Wood Duck.
132.	Mallard.	190.	Bittern.

191. Least Bittern.
194. Great Blue Heron.
201. Green Heron.
202. Black-crowned Night Heron.
221. Coot.
263. Spotted Sandpiper.
273. Killdeer.
316. Mourning Dove.
331. Marsh Hawk.
332. Sharp-shinned Hawk.
333. Cooper Hawk.
352. Bald Eagle.
364. Osprey.
366. Long-eared Owl.
390. Belted Kingfisher.
495. Cowbird.
611. Purple Martin.
612. Cliff Swallow.
613. Barn Swallow.
614. Tree Swallow.
616. Bank Swallow.
617. Rough-winged Swallow.
652. Yellow Warbler.

To these should be added the following which are distributed generally over the interior of the continent:

206. Sandhill Crane.
224. Wilson Phalarope.
258a. Western Willet.
305. Prairie Chicken.
511b. Bronzed Grackle.
547a. Western Henslow Sparrow.
633. Bell Vireo.

Two forms are characteristic of the high plains, of which a considerable portion of this state forms a part. These are:

420c. Sennett Nighthawk.
563a. Western Field Sparrow.

Thus Nebraska lies, roughly speaking, at the center of distribution of 38 forms.

The following birds breed mainly to the northward of us:

3. Horned Grebe.
77. Black Tern.
131. Hooded Merganser.
135. Gadwall.
137. Widgeon.
139. Green-winged Teal.
140. Blue-winged Teal.
143. Pintail.
146. Red-head.
147. Canvas-back.
150. Ring-necked Duck.
167. Ruddy Duck.
172. Canada Goose.
181. Trumpeter Swan.
249. Marbled Godwit.
254. Greater Yellow-legs.
256. Solitary Sandpiper.
261. Upland Plover.
264. Long-billed Curlew.
308b. Prairie Sharp-tailed Grouse.
349. Golden Eagle.
356. Duck Hawk.
367. Short-eared Owl.
372. Saw-whet Owl.
521. Red Crossbill.
533. Pine Siskin.
538. Chestnut-collared Longspur.
539. McCown Longspur.
561. Clay-colored Sparrow.
619. Cedar Waxwing.
758a. Olive-backed Thrush.

Six species are more abundant, as breeders, to the southward:

74. Least Tern.
197. Snowy Egret.
216. Black Rail.
325. Turkey Vulture.
327. Swallow-tailed Kite.
365. Barn Owl.

Naturally, most of our breeding birds are distributed along the same parallels of latitude as those which cut Nebraska, and the centers of abundance are either to the eastward or westward. In enumerating these forms those whose range extends rather more to the north or to the south of these parallels are indicated by the letters N or S, respectively, in parentheses. To the eastward are the following:

208. King Rail (S).
212. Virginia Rail (N).
214. Sora (N).
219. Florida Gallinule (S).
228. Woodcock (N).
277. Piping Plover.
289. Bob-white.
300. Ruffed Grouse.
337. Red-tailed Hawk.
339. Red-shouldered Hawk.
343. Broad-winged Hawk.
360. Sparrow Hawk.
368. Barred Owl (N).
373. Screech Owl.
375. Great Horned Owl.
387. Yellow-billed Cuckoo (S).
388. Black-billed Cuckoo.
393. Hairy Woodpecker.
394c. Northern Downy Woodpecker (N).
402. Yellow-bellied Woodpecker (N).
405. Northern Pileated Woodpecker (N).
406. Red-headed Woodpecker.
409. Red-bellied Woodpecker (S).
412a. Northern Flicker (N).
417. Whip-poor-will.
420. Nighthawk.
423. Chimney Swift.
428. Ruby-throated Hummingbird.
444. Kingbird.
452. Great-crested Flycatcher.
456. Phoebe.
461. Wood Pewee.
465. Acadian Flycatcher (S).
466a. Alder Flycatcher (N).
467. Least Flycatcher (N).
474b. Prairie Horned Lark (N).
477. Blue Jay.
488. Crow.
494. Bobolink (N).
498. Red-winged Blackbird (N).
501. Meadowlark (N).
506. Orchard Oriole (S).
507. Baltimore Oriole.
529. Goldfinch (N).
540. Vesper Sparrow (N).
552. Lark Sparrow.
560. Chipping Sparrow.
563. Field Sparrow.
581. Song Sparrow (N).
584. Swamp Sparrow (N).
587. Towhee (N).
593. Cardinal (S).
595. Rose-breasted Grosbeak (N).
598. Indigo Bunting.
604. Dickcissel (S).
608. Scarlet Tanager.

610. Summer Tanager (S).
622e. Migrant Shrike (N).
624. Red-eyed Vireo.
627. Warbling Vireo.
628. Yellow-throated Vireo.
631. White-eyed Vireo.
636. Black and White Warbler.
637. Prothonotary Warbler (S).
639. Worm-eating Warbler (S).
641. Blue-winged Warbler (S).
645. Nashville Warbler (N).
648a. Northern Parula Warbler (N).
658. Caerulean Warbler (N).
659. Chestnut-sided Warbler (N).
663a. Sycamore Warbler (S).
673. Prairie Warbler.
674. Oven-bird (N).
676. Louisiana Water-thrush (S).
677. Kentucky Warbler (S).
681. Yellowthroat (N).
683. Yellow-breasted Chat (S).
684. Hooded Warbler (S).
687. Redstart (N).
703. Mockingbird (S).
704. Catbird.
705. Brown Thrasher.
718. Carolina Wren (S).
719. Bewick Wren (S).
724. Short-billed Marsh Wren (N).
725d. Long-billed Marsh Wren (N).
726. Brown Creeper (N).
727. White-bellied Nuthatch (N).
731. Tufted Titmouse (S).
735. Chickadee (N).
751. Blue-gray Gnatcatcher.
755. Wood Thrush.
761. Robin.
766. Bluebird.

To the westward we find:

4. Eared Grebe.
225. Avocet.
281. Mountain Plover (N).
309. Sage Hen.
337a. Krider Hawk.
337b. Western Red-tail.
342. Swainson Hawk.
348. Ferruginous Rough-leg.
355. Prairie Falcon.
357b. Richardson Pigeon Hawk.
360a. Desert Sparrow Hawk.
375a. Western Horned Owl.
378. Burrowing Owl.
393e. Rocky Mountain Hairy Woodpecker.
394b. Batchelder Woodpecker.
408. Lewis Woodpecker.
413. Red-shafted Flicker.
418. Poor-will.
420a. Western Nighthawk.
425. White-throated Rock Swift.
432. Broad-tailed Hummingbird.
447. Arkansas Kingbird.
457. Say Phoebe.
462. Western Wood Pewee.
466. Traill Flycatcher.
474c. Desert Horned Lark (N).
475. Magpie.
492. Pinion Jay.
497. Yellow-headed Blackbird.
501.1. Western Meadowlark.
508. Bullock Oriole.
510. Brewer Blackbird.
529a. Western Goldfinch.
540a. Western Vesper Sparrow.
546a. Western Grasshopper Sparrow.
552a. Western Lark Sparrow.
560a. Western Chipping Sparrow.
562. Brewer Sparrow.
566. White-winged Junco (N).
588. Arctic Towhee.
596. Black-headed Grosbeak.
597a. Western Blue Grosbeak (S).
599. Lazuli Bunting.

605. Lark Bunting.
607. Western Tanager.
615. Violet-green Swallow.
622a. White-rumped Shrike.
627a. Western Warbling Vireo.
629b. Plumbeous Vireo.
656. Audubon Warbler.
675a. Grinnell Water-thrush (N).
680. MacGillivray Warbler.
681a. Western Yellowthroat.
683a. Long-tailed Chat.
702. Sage Thrasher.
703a. Western Mockingbird (S).
715. Rock Wren.
721a. Western House Wren.
727c. Rocky Mountain Nuthatch.
735a. Long-tailed Chickadee.
754. Townsend Solitaire.
761a. Western Robin.
768. Mountain Bluebird.

Again, to recapitulate, of the birds that make their home in Nebraska:

38 find here approximately their center of distribution,
31 are more abundant to the northward,
6 are more abundant to the southward,
94 are eastern birds, and
63 are western forms, making a total of 232.

IV

The distribution of animal life in Nebraska is such that those who have worked upon the problem have come unanimously to the recognition of five distinct regions, based particularly upon the study of the birds and mammals, but also substantiated by observations made upon other groups. These agree roughly with the phytogeographical areas into which the state has been divided,* and correspond to marked differences in topographical and climatological conditions. They have been previously defined† as follows:

1. The Missouri Region, including the wooded bottoms, bluffs, and ravines along the Missouri river, and extending outward along the tributary streams into the next region.

2. The Prairie Region, including rolling prairies, intersected with streams fringed with a straggling growth of timber, and extending westward approximately half way across the state. Its

*Pound and Clements. *The Phytogeography of Nebraska.* Lincoln: 1900.

†Wolcott. *Biological Conditions in Nebraska.* Proc. Neb. Acad. Sci., viii: 1906.

western limit, where it meets the sand-hill region, is an irregular but very definite line; to the northward it merges into the plains region in the Niobrara valley and south of the Platte it meets the plains region again by a boundary which is ill-defined.

3. The Sand-hill Region, a broad expanse of sand hills between the Niobrara valley on the north and the Platte valley on the south, together with several smaller outlying areas of sand hills south of the Platte and north of the Niobrara.

4. The Plains Region, high arid table-lands, westward from the preceding to the boundary of the state, extending eastward along the Niobrara and south of the Platte to meet the prairie region.

5. The Pine Ridge Region, a foot-hill area including the deep canyons of the Pine ridge in Sioux and Dawes counties, the sides of which are covered with an open growth of pines, while the deep, cool recesses have a thicker growth of pine and deciduous trees and harbor many plants of a northern distribution or of higher altitudes. (Conditions here have been well described by Cary in these Proceedings for the Third Annual Meeting, pp. 63–75.)

Of these regions the first two belong to the Carolinian faunal area, as defined by Merriam, which is the humid portion of the Upper Austral life zone; the third and fourth are in the Upper Sonoran, which is the arid portion of the same life zone; while the fifth is to be referred to the Transition zone. The character of the bird fauna in each region is determined by the conditions of temperature and moisture which form the basis for the establishment of these zones and areas, and also by other local conditions.

An enumeration of the more prominent environments in each region will serve to indicate the character of each and its possibilities as a place of residence for birds:

I. The Missouri region.
   1. The river, with its shifting sand-bars.
   2. The thickets of willow, and young cottonwoods.
   3. The tall bottomland timber, largely cottonwood.
   4. The cleared areas, cultivated fields, and scattered shrubbery of the bottom-lands.
   5. The cut-off ponds, and swamps or marshes.

6. The cool wooded ravines with springs and brooks.
7. The bluffs with open woods and shrubbery and occasional vertical clay banks, largely artificial in origin.

II. The prairie region.

1. The larger streams, generally broad and shallow and with shifting sand-bars and sandy mud-flats.
2. The smaller streams with steep, muddy banks.
3. The prairie ponds, with marshes and mud-flats, frequently alkaline.
4. The fringe of straggling timber and shrubbery along the streams.
5. Thickets of plum and other shrubs back from the streams, on higher ground, and following up the draws.
6. The open prairie, with weed patches, especially at the heads of the draws.
7. Planted groves.

This region follows up the river valleys into the sand-hill region.

III. The sand-hill region.

1. The open sand hills, with "blow-outs," where the wind has scooped out a sandpit, often twenty-five to fifty yards across.
2. Shrubbery here and there in sheltered pockets in the hills.
3. Wet valleys with hay flats, sloughs and marshes.
4. Lakes with sandy, marshy or boggy shores. Mostly without outlets. The streams which lead out of this region head in such lakes or bogs or marshes.
5. Tree-claims and groves about the ranches.

IV. The plains region.

1. The open level plains.
2. The few streams running frequently in more or less narrowed, often rock-walled, canyons.
3. Irrigating ditches and artificial ponds.
4. Few and relatively small marshy tracts along the streams or ditches or about the ponds.
5. Rocky buttes and ridges rising above the general level.

6. Straggling pine timber scattered over the sides of the canyons or on the tops and talus slopes of the buttes and ridges.
7. Deciduous trees and shrubbery in the bottoms of the canyons and along the streams.
8. The "bad lands."

V. The Pine ridge region.

1. The deep canyons, often several hundred feet in depth hemmed in by sheer rocky walls and pine-covered talus slopes.
2. The mixed pine and deciduous tree growth and shrubbery forming a dense cool thicket at the bottoms of the canyons where are cold springs, and, leading away from them, small brooks, which often are lost out in the valley, which belongs to the previous region and is Upper Sonoran.

V

In discussing the distribution of Nebraska birds with respect to the regions of the state outlined above, we have first to consider a considerable number which are able to adapt themselves to such a variety of conditions that they find a suitable environment in each of them, in which they are resident during the breeding season. They are as follows:*

289. Bob-white. Now general; formerly Mo. and Pr.
316. Mourning Dove.
325. Turkey Vulture.
333. Cooper Hawk.
342. Swainson Hawk.
357b. Richardson Pigeon Hawk. Now very rare.
360. Sparrow Hawk.
366. Long-eared Owl.
373. Screech Owl.
388. Black-billed Cuckoo.
406. Red-headed Woodpecker.
412a. Northern Flicker. More common eastward.
413. Red-shafted Flicker. More common westward.
444. Kingbird.
466. Traill Flycatcher.
488. Crow. Rare S. and westward.
495. Cowbird.

*In the lists which follow these abbreviations are used: Mo., Missouri region; Pr., prairie region; S., sand-hill region; Pl., plains region; P. R., Pine ridge region.

511b. Bronzed Grackle. Not common westward.
581. Song Sparrow. Northward only.
597a. Western Blue Grosbeak.
612. Cliff Swallow.
613. Barn Swallow.
622a. White-rumped Shrike.
624. Red-eyed Vireo.
652. Yellow Warbler.
674. Ovenbird. Very rare, if present, S.
687. Redstart. Rare S.
704. Catbird. More common eastward.
705. Brown Thrasher. Rare westward.
721a. Western House Wren.
735a. Long-tailed Chickadee.
755. Wood Thrush. Rare S. and westward.
761. Robin.
766. Bluebird. Rare westward.

The following are excluded from the Pine ridge region by the narrow sense in which that term is here applied, including only the wooded canyons, but are found in all the others:

4. Eared Grebe. Most common S.
6. Pied-billed Grebe.
132. Mallard. Not common except S.
140. Blue-winged Teal. Most common S.
172. Canada Goose. Formerly; now only S. and Pl. and rare.
190. Bittern. Most common S.
191. Least Bittern.
194. Great Blue Heron. Rare Pl.
202. Black-crowned Night Heron.
221. Coot. Most common S.
256. Solitary Sandpiper. Northward.
263. Spotted Sandpiper.
273. Killdeer.
331. Marsh Hawk.
367. Short-eared Owl.
390. Belted Kingfisher.
497. Yellow-headed Blackbird. Rare east of S.
498. Red-winged Blackbird.
501.1. Western Meadowlark.
604. Dickcissel.
616. Bank Swallow.
725d. Long-billed Marsh Wren.

There are a few birds which belong to the open country and are therefore common to the prairie, sand-hill, and plains regions, but not found in the other two. They are:

77. Black Tern. Most abundant S.
142. Shoveller. Rare except S.
206. Sandhill Crane. Rare except S.
249. Marbled Godwit. Northward.
254. Greater Yellowlegs. Northward.
261. Upland Plover.
277. Piping Plover. Rare Pl.
305. Prairie Chicken.
378. Burrowing Owl.
475. Magpie. Formerly; now only Pl. and P. R.
546a. Western Grasshopper Sparrow.
605. Lark Bunting.

It is worthy of note that no woodland birds are common to the two woodland regions, the Missouri and the Pine ridge.

The ranges of the following birds in the state are practically limited by the boundary of the Carolinian area, and they are therefore confined to the Missouri and prairie regions, except as they straggle out the fringe of trees and shrubbery along the rivers into the plains, or across to the lakes and marshes of the sand-hills:

74. Least Tern.
131. Hooded Merganser. Also in Pl. northward.
144. Wood Duck. Also in Pl. northward.
197. Snowy Egret. Southward.
201. Green Heron.
208. King Rail. Rare S.
212. Virginia Rail. Also S.
214. Sora. Rare S.
216. Black Rail.
219. Florida Gallinule. Rare S.
327. Swallow-tailed Kite. Southward.
337. Red-tailed Hawk.
339. Red-shouldered Hawk. Rare Pr.
365. Barn Owl.
368. Barred Owl.
375. Great Horned Owl.
387. Yellow-billed Cuckoo. Rare S.
393. Hairy Woodpecker. Into Pl. northward.
394c. Northern Downy Woodpecker. Into Pl. northward.
420. Nighthawk.
409. Red-bellied Woodpecker.
417. Whip-poor-will. Rare Pr.
423. Chimney Swift.
428. Ruby-throated Hummingbird.
452. Great-crested Flycatcher.
456. Phoebe. Rare S.
461. Wood Pewee.
465. Acadian Flycatcher. Rare Pr.
474b. Prairie Horned Lark.
477. Blue Jay. Rapidly extending in S. and Pl.
494. Bobolink. Into S. northward.
506. Orchard Oriole. Into Pl. north and south.
507. Baltimore Oriole.
529. Goldfinch.
540. Vesper Sparrow.
547a. Western Henslow Sparrow.
552. Lark Sparrow.
560. Chipping Sparrow.
563. Field Sparrow.
584. Swamp Sparrow. Rare S.
587. Towhee.
593. Cardinal. Southward.
595. Rose-breasted Grosbeak.
598. Indigo Bunting.
608. Scarlet Tanager.
611. Purple Martin.
614. Tree Swallow. Into Pl. northward.
617. Rough-winged Swallow. Into Pl. and S.
619. Cedar Waxwing. Into Pl. northward.
622e. Migrant Shrike.
627. Warbling Vireo.
628. Yellow-throated Vireo.
631. White-eyed Vireo. Rare Pr.
633. Bell Vireo.
636. Black and White Warbler. Into Pl. northward.
639. Worm-eating Warbler. Rare Pr.

677. Kentucky Warbler. Rare Pr.
681. Yellowthroat.
683. Yellow-breasted Chat.
703. Mockingbird.
718. Carolina Wren. Southward.
724. Short-billed Marsh Wren.
727. White-bellied Nuthatch.
731. Tufted Titmouse. Southward.

It may be added that the following are limited to this area in migrations:

215. Yellow Rail.
463. Yellow-bellied Flycatcher.
542a. Savanna Sparrow.
558. White-throated Sparrow.
585. Fox Sparrow.
626. Philadelphia Vireo.
629. Blue-headed Vireo.
642. Golden-winged Warbler.
647. Tennessee Warbler.
650. Cape May Warbler.
654. Black-throated Blue Warbler.
657. Magnolia Warbler.
660. Bay-breasted Warbler.
661. Black-poll Warbler.
662. Blackburnian Warbler.
667. Black-throated Green Warbler.
671. Pine Warbler.
672. Palm Warbler.
679. Mourning Warbler.
685. Wilson Warbler.
686. Canadian Warbler.
759b. Hermit Thrush.

The bird fauna of the Missouri region, naturally, is characterized particularly by the number of woodland forms, and those which follow, though they may straggle through the prairie region in their migrations, find only in the former, within the state, conditions suitable for summer residence and breeding.

228. Woodcock.
300. Ruffed Grouse.
343. Broad-winged Hawk.
352. Bald Eagle. Northward.
364. Osprey. Northward.
372. Saw-whet Owl.
382. Carolina Paroquet. Now extinct.
402. Yellow-bellied Woodpecker.
405. Northern Pileated Woodpecker. Now rare, if not extinct.
467. Least Flycatcher.
610. Summer Tanager. Southward.
637. Prothonotary Warbler.
641. Blue-winged Warbler.
645. Nashville Warbler.
648a. Northern Parula Warbler.
658. Caerulean Warbler.
659. Chestnut-sided Warbler.
673. Prairie Warbler.
676. Louisiana Water-thrush.
684. Hooded Warbler.
719. Bewick Wren. Southward.
726. Brown Creeper.
735. Chickadee. Rare, most specimens 735a.
751. Blue-gray Gnatcatcher.

Turning now to the Upper Sonoran we find the following birds ranging throughout the two regions belonging to this area:

264. Long-billed Curlew. Northward.
308b. Prairie Sharp-tailed Grouse. Northward.
348. Ferruginous Rough-leg.
375a. Western Horned Owl. Also P. R.
420c. Sennett Nighthawk.
447. Arkansas Kingbird. Rarely in Pr. also.
474c. Desert Horned Lark.
529a. Western Goldfinch.
540a. Western Vesper Sparrow.
552a. Western Lark Sparrow.
563a. Western Field Sparrow.
588. Arctic Towhee. Also P. R.
596. Black-headed Grosbeak. Also P. R.; rarely into Pr.
599. Lazuli Bunting. Rare S.
681a. Western Yellowthroat.
683a. Long-tailed Chat.

The following are confined as summer residents to the sand-hill region, the lakes and marshes of which harbor a numerous water-bird population:

3. Horned Grebe. Rare, northward.
69. Forster Tern.
135. Gadwall.
137. Widgeon.
139. Green-winged Teal. Rare, northward.
143. Pintail.
146. Red-head.
147. Canvasback. Rare.
150. Ring-necked Duck.
167. Ruddy Duck.
181. Trumpeter Swan. Formerly.
224. Wilson Phalarope.
225. Avocet.
258a. Western Willet. Rare.
501. Meadowlark. A local race about the lakes of Cherry county.

The following are common to the plains and the Pine ridge regions:

360a. Desert Sparrow Hawk.
418. Poor-will.
432. Broad-tailed Hummingbird.
457. Say Phoebe.
462. Western Wood Pewee. In groves.
475. Magpie. Formerly eastward to Pr.
715. Rock Wren.
761a. Western Robin.

These are characteristic of the plains region:

281. Mountain Plover.
309. Sage Hen. Northwestward.
337b. Western Red-tail. Rare.
420a. Western Nighthawk.
508. Bullock Oriole. In groves.
510. Brewer Blackbird. Also extending into Pr. northward.
538. Chestnut-collared Longspur. Northward.
539. McCown Longspur.
561. Clay-colored Sparrow. Northward.
562. Brewer Sparrow. Northwestward.
702. Sage Thrasher. Northwestward.
703a. Western Mockingbird.

Finally, the following are peculiar to the Transition in the Pine ridge region:

332.	Sharp-shinned Hawk.	533.	Pine Siskin.
337a.	Krider Hawk.	560a.	Western Chipping Sparrow.
349.	Golden Eagle.	566.	White-winged Junco.
355.	Prairie Falcon.	607.	Western Tanager.
356.	Duck Hawk.	615.	Violet-green Swallow.
393c.	Rocky Mountain Hairy Woodpecker.	627a.	Western Warbling Vireo.
		629b.	Plumbeous Vireo.
394b.	Batchelder Woodpecker.	656.	Audubon Warbler.
408.	Lewis Woodpecker.	675a.	MacGillivray Warbler.
425.	White-throated Rock Swift.	727c.	Rocky Mountain Nuthatch.
466a.	Alder Flycatcher.	754.	Townsend Solitaire.
492.	Pinion Jay.	758a.	Olive-backed Thrush.
521.	Red Crossbill.	768.	Mountain Bluebird.

To recapitulate, we have:

Forms generally distributed in the state		34
Forms excluded only from the Pine ridge region		22
Forms generally distributed in prairie, sand-hill, and plains regions		12
Forms belonging to the Missouri and prairie regions	64	
(Forms migrating through these two regions alone	22)	
Forms peculiar to the Missouri region	24	
Forms peculiar to the prairie region	0	
Total Carolinian forms (excluding migrants)		88
Forms of general distribution in the Sonoran area	16	
Forms peculiar to the sand-hill region	15	
Forms peculiar to the plains region	12	
Forms common to plains and Pine ridge regions	8	
Total Upper Sonoran forms		51
Forms peculiar to the Pine ridge region (Transition)		25
		232

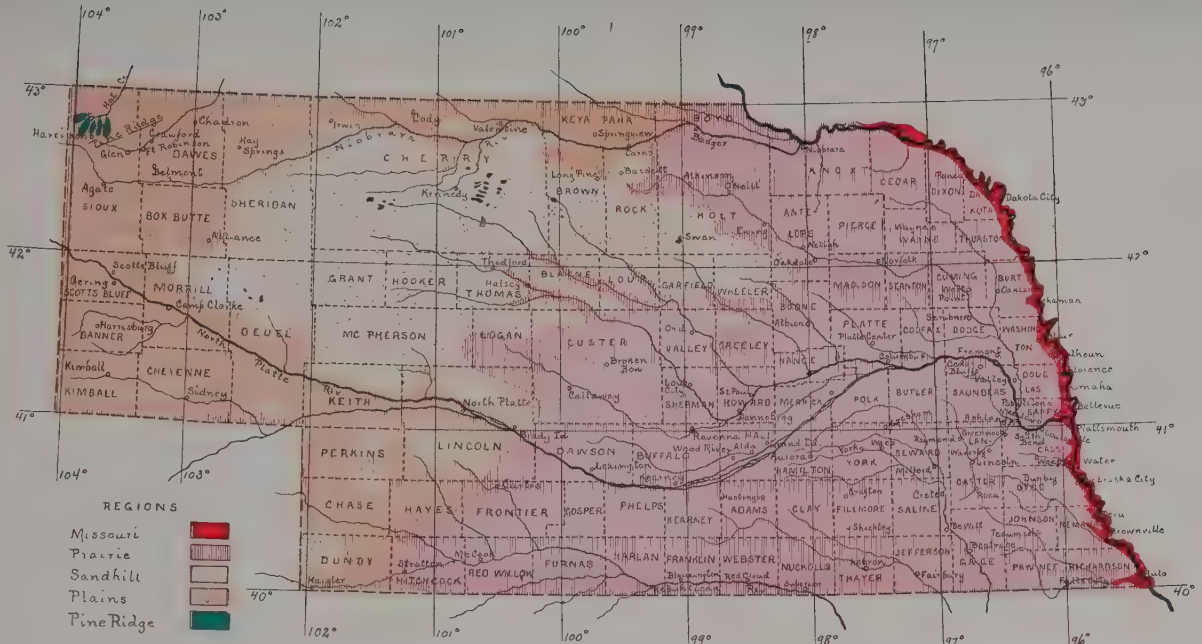
The five regions may be contrasted thus, excluding from each the forms which show a tendency to straggle into it from another:

	SUMMER RESIDENTS	PECULIAR TO IT
Missouri region	144	24
Prairie region	132	0
Sand-hill region	99	15
Plains region	104	12
Pine ridge region	67	25

The forms peculiar to both the Missouri and Pine ridge regions are mostly woodland forms; those peculiar to the sand hills, with one exception, water birds; while those peculiar to the plains are birds of the west which find the western end of Nebraska within the limit of their range. The prairie region is distinctly Carolinian, which brings it into contrast with the sand-hill region, which is Upper Sonoran; but it has no marked physical or floral features, such as have the other regions, to attract forms peculiar to it, and is marked off from the rest of the Carolinian area by negative rather than positive characters. The small number of forms in the Pine ridge region is due to the narrow limit here set to it, practically restricting it to woodland forms.

VI

Of course neither resident birds nor migrants are evenly distributed through any given type of environment, and birds are often migrant in environments from which as residents they are excluded. Studies expected to furnish data in regard to such local distribution of forms within our state are now being carried on, but have not progressed far enough to permit of exact statements being made. It is hoped that more of our members than are now engaged in such investigations may participate. Most valuable work can be done in any locality by one who will make a careful study of the local bird fauna with respect to occurrence and abundance of different forms in the various local environments and during the different seasons of the year.



THE FAUNAL REGIONS OF NEBRASKA

PLATE I

THE MISSOURI REGION.—Upper figure, a view near Peru, showing a wooded bluff, the Missouri river with sandbars, islands and bottomland timber, and the opposite bluffs in the distance. Lower figure, a creek in Richardson county, nine miles from its confluence with the Missouri, showing heavy timber.

The Prairie Region.—Upper figure, a piece of virgin open prairie four miles west of Lincoln, showing the upper end of a draw. Lower figure, a view in Johnson county, showing the manner in which timber follows up a creek valley and out into tributary draws.

THE SAND-HILL REGION.—Upper figure, a view in the sand hills, on the Dismal river Forest Reserve, Thomas county, showing the characteristic topography. Lower figure, Watt's lake, Cherry county, a typical sand-hill lake surrounded by reeds and rushes; sand in the foreground, hills in the distance.

The Plains Region.—Upper figure, a view in Box Butte county showing the open plains. Lower figure, a pond made by damming the Minnechaduza near Valentine. Shows a river-valley in the plains region with a growth of deciduous trees and shrubbery next the river, the barren slopes covered with a straggling growth of pine, and the flat open plains stretching away beyond.

THE PINE RIDGE REGION.—View looking backward into a canyon on the north side of Pine ridge showing its depth, and the dense growth of vegetation in its recesses, which harbor transition forms.

PROCEEDINGS

OF THE

NEBRASKA ORNITHOLOGISTS' UNION

AT ITS

NINTH, TENTH AND ELEVENTH ANNUAL MEETINGS

Bellevue, Nebr., May 8 and 9, 1908
Lincoln, Nebr., May 14 and 15, 1909
Peru, Nebr., April 29 and 30, 1910

EDITED BY
MYRON H. SWENK

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VOL. V, PART 1 AUGUST 20, 1910

PROCEEDINGS OF THE

NEBRASKA ORNITHOLOGISTS' UNION

OFFICERS

1907–08. President.....Myron H. Swenk, Lincoln
Vice-President.....Emily Wood, Omaha
Secretary.....Wilson Tout, North Platte
Treasurer.....F. H. Shoemaker, Omaha

1908–09. President.....August Eiche, Lincoln
Vice-President.....Jeanette McDonald, Omaha
Secretary.....Myron H. Swenk, Lincoln
Treasurer.....F. H. Shoemaker, Omaha

1909–10. President.....H. B. Duncanson, Peru
Vice-President.....Joy Higgins, Omaha
Secretary.....Myron H. Swenk, Lincoln
Treasurer.....G. M. Pinneo, Lincoln

ABSTRACT OF MINUTES

NINTH ANNUAL MEETING

The first session of the ninth annual meeting of the Nebraska Ornithologists' Union was called to order in the Presbyterian Church at Bellevue, Nebraska, at 7:45 P.M. on Friday, May 8, 1908, with President Myron H. Swenk in the chair. Fourteen members were present, Messrs. Bruner, Livers, Shoemaker, Smith, Swenk, Wolcott and Zimmer, and Misses Bruner, Harper,

Hitte, McDonald, Stringer, VanSant and Wood. In the absence of Secretary Wilson Tout, R. H. Wolcott acted temporarily in that capacity.

The report of the Treasurer was read and referred to an auditing committee composed of Messrs. Bruner, Livers and Smith. R. H. Wolcott reported briefly for the Record Committee. The names of Messrs. W. L. French of Peru, E. B. Salter of Norfolk, and Misses Joy Higgins and Mary Alter of Omaha were proposed for membership and duly elected by the society. On a motion to that effect all new business was postponed until the next session and the election of officers was taken up. The ballot resulted in the election of the following as officers for 1908–09:

President, August Eiche, Lincoln,
Vice-President, Jeanette McDonald, Omaha,
Secretary, Myron H. Swenk, Lincoln,
Treasurer, F. H. Shoemaker, Omaha.

The business meeting then adjourned at 8:15 P.M. to take up the public program of the evening. Many visitors from Omaha and students from Bellevue College were present, comfortably filling the church. The program was opened by an invocation by Dr. Phelps, who then warmly welcomed the Union to Bellevue and lauded the efforts of the society to popularize bird study by distributing its meetings among the various educational centers of the state. President Swenk responded on behalf of the Union and explained the aims and past history of the Union and its ambitions for the future. He also cordially invited the people of Bellevue to accompany the field parties on the excursion of the next day. The following program was then rendered:

President's Address, "A Sketch of the Evolution of Our Bird Fauna" - - - - Myron H. Swenk
"The Uses that Birds Have Made of Structures Built by Man" - - - - - - R. H. Wolcott
"The Crow Family (Corvidae) in Nebraska - Lawrence Bruner
"Devices of Bird Study" - - - - - Wilson Tout

The program concluded at 9:30 P.M. after the members had enjoyed a short social session.

The second session was called to order at 8:00 P.M. on Saturday, May 9, after the field trip, in the same room as on the preceding evening. Eleven members were present, Messrs. French, Livers, Shoemaker, Smith, Swenk, Tout, Wolcott and Zimmer and Misses Marshall, VanSant and Wood. Eleven visitors were also in attendance. The names of Captain Crimmins of Fort Crook and Mrs. Childs of "Childs' Point" near South Omaha were presented for membership and the persons elected. The report of the Treasurer was accepted, having been found correct by the auditing committee.

New business being in order it was moved and carried that the Union prepare check-lists for field use and supply them to members at cost. The matter of planning for the publication of a new "Birds of Nebraska" was taken up, and after some discussion it was moved that the matter be referred to a committee to be appointed by the chair, to attempt to devise some plan for publication, investigating the cost and to report at the next meeting. The motion was carried. The President appointed on this committee Messrs. Wolcott, Shoemaker and Tout, with instructions to report at the next meeting.

Following the new business the more technical part of the program was taken up. R. H. Wolcott presented a very interesting discussion of the "Variation in Cherry County Meadowlarks" and illustrated the same with specimens. Discussion of the topic by several members followed. Myron H. Swenk then presented a short paper on "Ornithological Book-Keeping" in which the new records established since the publication of the "Birds of Nebraska" in 1904 were discussed. Six new forms have been added, thus bringing the total number of definitely recorded species and subspecies in our list to 402. Following this paper a few minutes were devoted to recording the principal bird notes of the year. Mr. Ira C. Jenks of Santa Rosa, California, then addressed the Union on California birds and illustrated his remarks by the exhibition of numerous specimens. Following this address the Union adjourned at 9:30 P.M.

WILSON TOUT, *Secretary.*

SIXTH ANNUAL FIELD DAY.—Leaving Bellevue at 6:30 A.M.

Saturday morning, May 9, 1908, one division of the field party proceeded north along the Burlington tracks paralleling the Missouri river to Childs' Point, there meeting with the second division which had left South Omaha at 5:45 A.M. and proceeded eastward from Childs' Crossing on the interurban. The whole party, consisting of twenty-one members of the Union and a large number of their friends from Omaha and Bellevue, took dinner together at Coffin Springs. The composite list of species seen by members of the party during the forenoon was seventy-eight, and to this several additions were made by the explorations of the afternoon.

TENTH ANNUAL MEETING

The tenth annual meeting of the Nebraska Ornithologists' Union was called to order in the ordinary of the Lincoln Hotel at Lincoln, Nebraska, at 8:15 P.M., with President Eiche in the chair. During the afternoon the members had gathered at Mr. Eiche's home and spent several hours there in examining his splendid collection of mounted birds, after which all had met at the hotel for a banquet at 7:00 P.M. Ten members were present, Messrs. Bruner, Duncanson, Eiche, Pinneo, Sheldon, Swenk, Tout, Wolcott and Zimmer and Miss Higgins. Three visitors were also present as guests of the Union.

The Secretary reported on the publication of the check-lists and the proceedings of the society, the present condition of the property of the Union and its exchanges, and by vote of the society his report was approved. The Treasurer being absent and his report not yet at hand, the Secretary moved that an auditing committee be appointed by the chair to audit the report when received and if found to be correct to refer the same to the Executive Committee for acceptance. The motion was carried. The President appointed Messrs. Wolcott, Bruner and Swenk as the auditing committee.

R. H. Wolcott reported for the Record Committee, stating that as no records had been referred to it during the past year no session had been held, but that probably action would be taken on

various new records in the near future. Wilson Tout reported very interestingly for the Educational Committee, describing the progress of their efforts to work out a course of bird study for the schools, both in the grades and in high schools. He stated that many of the teachers were eager for such help, although some were indifferent. He described the very successful outcome of the May Day list contest, stating that over 1,000 lists were sent in, and quoted some of the favorable reports on it from various schools. Mr. Tout's idea was that by interesting the boys and girls in bird study we would not only do much toward strengthening the spirit of bird protection but also increase greatly the number of future bird lovers and bird scientists, and thus lay a proper foundation for the permanence of the Union and its work. Mr. Tout's report was adopted and discussed by R. H. Wolcott and H. B. Duncanson. The latter gentleman at the close of his remarks moved that the Educational Committee be asked to draft a scheme for bringing the Union in closer contact with the nature study work of the schools and to bring out greater interest in bird study, and to report their plan to the Executive Committee for final approval before putting it into operation. This motion was unanimously carried. The Birds of Nebraska Publication Committee appointed at the last session, not being ready to report, was on motion of the Secretary continued for another year.

The proposal of new names for membership in the Union being in order, the names of Messrs. C. V. Williams and C. R. Weeks of Peru, C. G. Phillips of Aurora, Dr. D. C. Hilton of Lincoln, Mr. and Mrs. J. S. Ewart of Lincoln, and Miss Louise McPherson of Omaha were submitted and all were elected to membership.

The Secretary moved that he be empowered to send out checklists to members free of cost, if, with the request for them, sufficient postage were forwarded for their delivery. The motion prevailed. Wilson Tout wished to recommend that the Record Committee pass upon all the new records to date and publish same in the proceedings, and also maintain a department of current notes, which suggestion met with approval by the members present.

The election of officers for 1909–10 was then taken up, the ballot resulting as follows:

President, H. B. Duncanson, Peru,
Vice-President, Joy Higgins, Omaha,
Secretary, Myron H. Swenk, Lincoln,
Treasurer, G. M. Pinneo, Lincoln.

At this point the new President was installed, and on request gave a short talk on his hopes for the Union during the coming year. The program was then taken up and the following papers presented by various local members:

President's Address, "The Ducks of the State" (read by title) - - - - - - - - August Eiche, Lincoln
"Some Results of Four Years' Collecting in the Vicinity of Lincoln" - - - - - J. T. Zimmer, Lincoln
"A Few Things We Can Do" - R. H. Wolcott, Lincoln
"The Past and Present of the N. O. U." Lawrence Bruner, Lincoln
"My Diary of Bird Observations Made at Lincoln" (read by title) - - - - - - - H. B. Lowry, Lincoln
"Ideas on the Intergrading Ranges of Certain Subspecies in Nebraska" (read by title) - Myron H. Swenk, Lincoln

Following the program and the discussion of the papers given, the Union adjourned at 10:30 P.M.

MYRON H. SWENK, *Secretary.*

SEVENTH ANNUAL FIELD DAY.—Saturday morning, May 15, 1909, the field party of the N. O. U. left the viaduct west of Lincoln at 7:00 A.M. and proceeded to the saline flats and lake in the vicinity, but owing to the very heavy rainfall of the preceding day and night these were greatly flooded and the waterfowl and shore birds much scattered. The mill woods on the north shore of the lake were thoroughly explored. Returning, the party left on the Union Pacific for Hanlon, 12 miles south of Lincoln, at 11:05 A.M. Immediately after arrival lunch was eaten in the woods and the remainder of the day spent in the vicinity, the party arriving in Lincoln again at 5:45 P.M. The composite list of the day reached ninety-four species, the largest made since the first annual field day seven years previously.

ELEVENTH ANNUAL MEETING

The eleventh annual meeting of the Nebraska Ornithologists' Union was held at Peru, Nebraska, Friday and Saturday, April 29 and 30, 1910. The first meeting was a public one held in the Peru Normal Chapel, on the evening of April 29 at 8:30 o'clock. Professor H. B. Duncanson, the retiring President, had the meeting in charge. An address of welcome by President J. W. Crabtree of the Normal School was followed by the appearance of the Peru Glee Club which rendered several very enjoyable numbers. A reading appropriate to the occasion was given by Mrs. Daisy Nettleton and was much appreciated. President Duncanson then proceeded with his annual address, which was upon the subject, "Some Interesting Points in the Embryological Development of Birds," and was well illustrated with lantern slides. Upon the close of this address Professor Lawrence Bruner responded to a request of the President that he discuss briefly the subject of Bird Study, taking up this line of thought in a very original and entertaining way. Announcement was then made of the field trip to be held the next day, to which all of the visitors present were invited. Adjournment at 10:30.

Eighth Annual Field Day.—A start was made from Peru at 6:30 A.M. Saturday morning, April 30, about fifty people joining in the party. The party divided into three sections, all maintaining a parallel course from Peru, northwestward along the Missouri bluffs to a position directly east of Julian, which was reached shortly after noon. A camp dinner was then prepared and enjoyed by all, after which a business meeting of the Union was held in the woods. The meeting was called to order by President Duncanson. The Treasurer's report, in the absence of that officer, was read by the Secretary and referred by the President to an auditing committee composed of Messrs. Bruner, French and Wolcott. The Secretary and Vice-President being present reported briefly. The names of Messrs. A. C. Whitford and L. O. Horsky were proposed for membership and both were duly elected. The constitutional amendment proposing to combine the offices of Secretary and Treasurer, owing to the difficulty of easily handling the business of the Union when placed in the

hands of two members sometimes living in different towns, was taken up and adopted without debate. The amendment involved amending Article IV, Section 1, to strike out the words "a Secretary and a Treasurer" and substituting "a Secretary-Treasurer," and combining Sections 3 and 4 of Article V, entitling same "Duties of the Secretary-Treasurer," and numbering it Section 3 and numbering Section 5 Section 4; also changing the word "Secretary" in Section 3 of the by-laws to "Secretary-Treasurer." The election of officers was then taken up, the ballot resulting in the election of the following for 1910–11:

President, L. Sessions, Norfolk,
Vice-President, Mrs. A. E. Sheldon, Lincoln.
Secretary-Treasurer, Myron H. Swenk, Lincoln.

After a short informal discussion of the next meeting, publications, etc., the business session adjourned and the party continued the field trip to Barney, where a Burlington train was caught at 6:00 P.M. The composite list of the field party for the day numbered seventy-five species of birds.

MYRON H. SWENK, *Secretary.*

REPORT OF TREASURER, 1907–08

RECEIPTS

Cash on hand, May 18, 1907	$ 65.20
1 Annual dues for 1906—Active	2.00
1 Annual dues for 1906—Associate	1.00
19 Annual dues for 1907	38.00
	$106.20

EXPENDITURES

Telegrams of postponement Weeping Water meeting	$ 1.00
Postage on announcements and Proceedings	2.00
Printing of Proceedings, Vol. IV, part 1, Jacob North & Co.	37.85

Exchange	.15
Balance on hand, May 8, 1908	65.20
	$106.20

Respectfully submitted,
FRANK H. SHOEMAKER, *Treasurer.*

REPORT OF TREASURER, 1908–09

RECEIPTS

Cash on hand, May 8, 1908	$ 65.20
1 Annual dues for 1906—Associate	1.00
11 Annual dues for 1907	22.00
20 Annual dues for 1908	40.00
	$128.20

EXPENDITURES

Printing of 5,000 check-lists of Nebraska Birds	$ 31.05
Postage, Secretary	2.00
Postage, Treasurer	3.40
Balance on hand, May 15, 1909	91.75
	$128.20

Respectfully submitted,
FRANK H. SHOEMAKER, *Treasurer.*

REPORT OF TREASURER, 1909–10

RECEIPTS

Cash received from previous Treasurer, May 15, 1909	$ 91.75
1 Annual dues for 1906—Active	2.00
1 Annual dues for 1906—Associate	1.00
2 Annual dues for 1907	4.00

8 Annual dues for 1908	16.00
24 Annual dues for 1909	48.00
Balance from banquet	1.00
Sale of Proceedings	3.45
Interest on account	1.06
	$168.26

EXPENDITURES

Cornell Engraving Co., halftones for Proceedings, Vol. IV, part 2	$ 30.53
Jacob North & Co., printing Vol. IV, part 2	78.50
Postage, Secretary	3.55
Stenography, Secretary	1.90
Balance on hand, April 30, 1910	53.78
	$168.26

Respectfully submitted,
G. M. PINNEO, *Treasurer.*

CONSTITUTION AND BY-LAWS

ARTICLE I. (Name and Object)

Section 1. This Association shall be known as The Nebraska Ornithologists' Union.

Sec. 2. Its aims shall be to promote the study of ornithology by more closely uniting the students of this branch of natural history, and to encourage the study of birds in the state of Nebraska.

ARTICLE II. (Members)

Section 1. Any student of ornithology resident in Nebraska, not less than sixteen years of age, may become a member on receiving a majority vote of the members present at any meeting. All members in good standing shall have the right to vote and hold office.

Sec. 2. Honorary members shall be elected for their eminence in ornithology or for distinguished services in furthering the aims for which this Union is established.

Sec. 3. Application for membership in the interim between meetings may be considered by the Executive Committee, and the application granted by a unanimous vote of the committee.

ARTICLE III. (Quorum)

Section 1. A quorum for the transaction of business shall be the active members present at any annual meeting, provided the number is not less than nine.

ARTICLE IV. (Officers and Committees)

Section 1. The officers of this Union shall be: a President, a Vice-President and a Secretary-Treasurer.

Sec. 2. There shall be an Executive Committee consisting of the officers.

Sec. 3. Standing committees shall be appointed by the President with the concurrence of the Executive Committee.

ARTICLE V. (Duties of Officers and Committees)

Section 1. Duties of the President. It shall be the duty of the President to preside at all the meetings of the Union, to appoint the standing committees, and to perform such other duties as may properly pertain to the office.

Sec. 2. Duties of the Vice-President. It shall be the duty of the Vice-President to act in the absence or incapacity of the President.

Sec. 3. Duties of the Secretary-Treasurer. It shall be the duty of the Secretary-Treasurer to keep a record of all the meetings of the Union, to countersign all orders and documents issued by the President, to conduct the general correspondence of the Union, to prepare the program of the meetings, to send out the call for such meetings, to superintend the publication of the Proceedings of the Union, to have charge of all property of the Union, to receive and have charge of all moneys of the Union and to pay such bills as are indorsed by the President and to perform such other duties as properly pertain to this office.

Sec. 4. Duties of the Executive Committee. It shall be the duty of the Executive Committee to fix the date and place of the annual meeting, to act on applications for membership as provided in Article II, section 3, to concur in the appointment of standing committees as provided in Article IV, section 3, to fill by temporary appointment offices which shall become vacant, and to nominate three persons for each of the several offices that are to be filled annually.

ARTICLE VI. (Election of Officers and Committees)

Section 1. The election of all officers shall be by ballot, a majority of those voting being required to elect, and the Secretary-Treasurer shall send a list of the nominees of the Executive Committee to each member one month before the date of the annual meeting.

Sec. 2. The term of office shall extend from the end of one annual meeting to the end of the next one.

ARTICLE VII. (Meetings)

Section 1. The annual meeting of the Union shall be held at such place and time as the Executive Committee shall decide.

ARTICLE VIII. (Dues and Assessments)

Section 1. The annual dues of the members shall be two dollars ($2), due at the time of election to membership and on the date of each annual meeting thereafter.

Sec. 2. In case of failure to pay dues before the close of the year, a member shall forfeit his right to the publications of the Union.

Sec. 3. In case of failure to pay dues for two years a member shall be dropped from the roll of the Union.

ARTICLE IX. (Amendments)

Section 1. An amendment to this constitution may be adopted by an affirmative vote of two-thirds of the members present at any annual meeting, one month notice of the proposed amendment having been given all members.

BY-LAWS

Section 1. The actual amount expended by the officers in carrying on their official duties shall be refunded to them.

Sec. 2. All members in good standing shall receive gratis one copy of the publications of the Union. Other copies of the publications may be distributed under sanction of the Executive Committee.

Sec. 3. All papers presented at the meetings shall be the property of the Union and shall be filed with the Secretary-Treasurer.

Sec. 4. The order of business at the annual meeting shall be as follows: 1, Reports of Officers; 2, Reports of Committees; 3, Proposal of Names and Election of Members; 4, New Business; 5, Announcement of Election of Officers and Committees; 6, Pre-

sentation and Discussion of Papers and Remarks; 7, Installation of Officers; 8, Reading of Minutes; 9, Adjournment.

Sec. 5. Application for membership must be made to the Executive Committee, and such application must have the indorsement of at least one member in good standing, which shall be expected to be a proper recommendation of the candidate.

Sec. 6. Any of the By-Laws may be amended or repealed by vote of a majority of the members.

LIST OF MEMBERS

Corrected to July 1, 1910. Names of Charter Members indicated by an asterisk.

HONORARY MEMBERS

Miller, Dr. George L., 624 N. 19th St., Omaha..... 1901

MEMBERS

Alter, Miss Mary, 413 N. 25th St., Omaha..... 1908
Arter, Jason, Kirkwood 1902
Barbour, Miss Carrie, Dept. Geology, Uni. of Neb., Lincoln 1902
*Bates, Rev. J. M., Red Cloud..... 1900
Bruner, H. F., Swan P. O., Holt County..... 1901
*Bruner, Prof. Lawrence, Dept. Entomology, Uni. of Neb., Lincoln 1900
Childs, Mrs. Lowrie, Maxwellton, Ft. Crook Bvd., South Omaha 1908
Crimmins, Captain M. L., Ft. Crook..... 1908
Dawson, Miss Agnes M., 514 N. 23d St., Omaha..... 1903
Duncanson, Prof. H. B., Dept. Zoology, State Normal, Peru, 1901
*Eiche, August, 1133 O St., Lincoln..... 1900
Ewart, Mrs. J. S., 27th and P Sts., Lincoln..... 1909
French, Prof. W. L., Dept. Dairy Husbandry, Uni. of Neb., Lincoln 1908
Gifford, Dr. H., 563–573 Brandeis Bldg., Omaha..... 1903
Griggs, Prof. Leland, Doane College, Crete..... 1907

Harper, Miss Alice, 2416 Cass St., Omaha..... 1906
*Hayward, Mrs. Mary Smith, Chadron..... 1900
Higgins, Miss Joy, 527 Park Ave., Omaha..... 1908
Hitte, Miss Alice E., 102 S. 25th Ave., Omaha..... 1904
Hilton, Dr. David C., 1238 O St., Lincoln..... 1909
Horsky, L. O., Mailing Division, P. O., Omaha..... 1910
Littell, Mrs. Elsie, County Superintendent of Schools, Wayne 1910
Livers, Rev. Ralph W., 722 N. 25th St., South Omaha.... 1907
Lowry, Dr. H. B., 843 S. 10th St., Lincoln..... 1901
McDonald, Miss Jeanette, 318 S. 26th St., Omaha..... 1905
McPherson, Miss Louise, 701 Park Ave., Omaha..... 1909
Payne, Mrs. Geo. H., W. Dodge St., Omaha..... 1901
Phillips, C. G., Aurora 1909
Pinneo, G. M., Y. M. C. A. Bldg., Lincoln..... 1905
Pollard, Hon. Isaac, Nehawka..... 1903
Salter, E. B., Norfolk 1908
*Sessions, L., Norfolk 1900
Sheldon, Mrs. A. E., Lincoln 1904
*Shoemaker, F. H., 2960 Dewey Ave., Omaha..... 1900
Smith, Mrs. Chas. C., Exeter 1907
*Swenk, Prof. Myron H., Dept. Entomology, Uni. of Neb., Lincoln 1900
Tobitt, Miss Edith, Omaha Public Library, Omaha..... 1907
*Tout, Wilson, Superintendent of Schools, North Platte.. 1900
Towne, Dr. S. R., 446 Brandeis Bldg., Omaha..... 1902
*VanSant, Miss Elizabeth, 2960 Dewey Ave., Omaha..... 1900
Weeks, C. R., Dept. Agriculture, State Normal, Peru..... 1909
Whitford, A. C., Ashland High School, Ashland..... 1910
Williams, C. V., Dept. Biology, State Normal, Peru..... 1909
*Wolcott, Prof. R. H., Dept. Zoology, Uni. of Neb., Lincoln 1900
Wood, Miss Emily, 2416 Ellison Ave., Omaha..... 1901
Zimmer, J. T., Dept. Entomology, Uni. of Neb., Lincoln.. 1907

Vol. V, Part 2 March 1, 1911

PROCEEDINGS OF THE

NEBRASKA ORNITHOLOGISTS' UNION

SOME NOTES ON THE WINTER BIRDS OF DAWES COUNTY

BY JOHN T. ZIMMER

In the latter part of November, 1910, it became necessary for me to spend a couple of weeks in the vicinity of Crawford, Dawes county, Nebraska, in field investigations of an entomological nature. However as abundant opportunity was offered, I was enabled to make some rather extensive observations on the bird life of that region. Previously on but two occasions had systematic ornithological observations been made in that part of the state during cold weather, once during middle December, 1895 and again from February 18 to 29, 1896, in reality parts of the same winter, when parties headed by Professor Lawrence Bruner worked in that locality.

I arrived in Crawford on November 26 and on the next day proceeded south-eastward from the town to the vicinity of Squaw mound, near the head of Squaw creek, where I made my headquarters until December 5, on which date I returned to Crawford. I then explored the valley of the White river until December 10, when I returned to Lincoln. One side trip was made. On December 9 I visited Glen, in Sioux county, where I spent the day and returned the same evening. With this exception, all my observations were made within the bounds of Dawes county.

I might here make a brief statement regarding the types of country visited. The vicinity of Squaw mound on the Pine ridge is high table-land or plateau containing the heads of numerous canyons which are destitute of deciduous timber

at this altitude but support a heavy growth of pines and cedars. Lower down in these canyons water appears, together with the beginnings of deciduous growth or "brush-timber" as it is called by the ranchmen. Down in the valley of the White river, about one thousand feet below the summit of Squaw mound, and in the more immediate vicinity of Crawford, this kind of growth prevails, although the buttes which rise near the river possess the coniferous trees and have the accompanying faunal characteristics. Glen, in Sioux county, is not radically different from the Crawford territory as it is also situated on the banks of the White river.

The following list comprises the extent of the winter bird fauna of this region as I found it. Several of the forms are new definite records for the state, viz., Western Evening Grosbeak, Mountain Pine Grosbeak, Cassin Purple Finch, Pink-sided Junco and Mountain Song Sparrow, and these will be noted more fully in the individual discussions of each species.

1. *Branta bernicla glaucogastra* (Brehm)—Brant.

   A single flock of twelve of these birds was observed on November 30. I was on the summit of the ridge and the birds passed rather near to me so that I was able to make out very distinctly the white on abdomen and sides of neck. My attention was first attracted to the birds by their note which was much hoarser than that of the Canada Goose and resembled a grunt more than a "honk."

2. *Gallinago delicata* (Ord)—Wilson Snipe.

   On December 7, while following down a little stream which empties into the White river, I flushed three of these birds. I fired at one of them but it continued on its way around a bend in the stream, and on following the line of its flight, I found my bird lying in the water on a bunch of cress, from which it was easily secured. It had been shot and wounded previously, for its breast contained a very large scar, which was, however, completely healed over. Wilson Snipe has been found before in Sioux and Dawes counties at this season of the year and is evidently a regular resident, found wherever the presence of numerous springs secures a soft, boggy soil.

3. *Colinus virginianus* (Linnaeus)—Bob-white.

   I observed flocks of Bob-white at Crawford on December

6 and 7, and at Glen, on December 9, I saw several coveys. None were found on the high plateau, but all were seen in the lower valleys.

4. *Pedioecetes phasianellus campestris* Ridgway — Prairie Sharp-tailed Grouse.

These birds were seen only on the evening of November 27 on the plateau at the head of Squaw canyon, where a flock of eighteen or so passed me on their way toward some roosting place. A single individual had been observed somewhat earlier in the day in the same general locality.

5. *Circus hudsonius* (Linnaeus)—Marsh Hawk.

I observed this hawk but once, on December 5, near Crow butte.

6. *Archibuteo lagopus sancti-johannis* (Gmelin) — Rough-legged Hawk.

This hawk was noted but once, December 1, near Squaw mound.

7. *Archibuteo ferrugineus Lichtenstein*—Ferruginous Rough-leg.

This bird also was seen on but a single occasion. A pair was observed on November 28. The birds rose from their posts at my approach and as they sailed away displayed the conspicuous white marking at the base of the tail.

8. *Aquila chrysaetos* (Linnaeus)—Golden Eagle.

While exploring the rocky cliffs of the Pine ridge south of Crow butte on December 3, I surprised a single Golden Eagle from his perch on a peculiar, chimney-shaped piece of rock which rose sheer twenty or thirty feet from the narrow summit of the ridge.

9. *Falco peregrinus anatum* Bonaparte—Duck Hawk.

The only record I have of this species is on December 8 when one of the hawks was noted flying over the hills between Crawford and Fort Robinson. It was reported by Professor Bruner in 1903 as probably breeding about eight miles west of the fort.

10. *Falco columbarius* Linnaeus—Pigeon Hawk.

On December 3, while I was watching a flock of juncos, the birds suddenly stopped their chattering, flocked to-

gether, flattened all their feathers and seemed to lose all fear of me. I looked around for the cause and discovered a Pigeon Hawk. The bird was dashing into another flock of juncos in a little thicket across the canyon and endeavoring to capture one. The juncos were too active and, in addition, were protected by the network of branches through which the hawk could not force itself and it succeeded in catching one only after a number of attempts.

11. *Falco sparverius phalaena* Lesson—Desert Sparrow Hawk.
I was surprised to note this species on November 30 on which date I saw a single bird on the high plateau. A few days later, December 2, while exploring a little canyon in the near vicinity of this first locality, I caught a hasty glimpse of a hawk as it disappeared around a bend in front of me, and from the impression I received of its size and coloration in the brief moment I had it in view, I concluded it to be this species, possibly the same bird previously seen. I refer this note to *phalaena* rather than to typical *sparverius* as the former is the breeding form in northwestern Nebraska.

12. *Cryptoglaux acadica* (Gmelin)—Saw-whet Owl.
I saw this little owl along the White river between Crawford and Fort Robinson on December 8. My attention was drawn to the presence of the bird by the actions of a flock juncos and tree sparrows, most of which sought concealment though one or two of the boldest White-winged Juncos followed the intruder the length of the grove. This owl is probably an uncommon resident in that part of the state. as elsewhere in Nebraska.

13. *Dryobates villosus monticola* Anthony—Rocky Mountain Hairy Woodpecker.
Hairy woodpeckers, undoubtedly referable to this form, were noted on November 28 and 30 and December 3, 9, and 10.

14. *Dryobates pubescens homorus* Cabanis and Heine—Batchelder Woodepcker.
I saw and secured three individuals of this bird on December 3 and 7. It is the resident form of the downy woodpecker in this region.

15. *Colaptes cafer collaris* Vigors—Red-shafted Flicker.

A single individual, flushed near the base of Saddle-back butte, was the only one I saw of this species.

16. *Otocoris alpestris leucolaema* (Coues)—Desert Horned Lark.

This form of the horned lark, which is also the breeding form of the region under discussion, was abundant and occurred in large flocks both on the high plateau and in the White river valley. They were seen practically every day and were the only variety of the species noted. Several specimens were secured, one of which was found on the railroad track some distance from any telegraph wires and with no marks on it to account for its death.

17. *Pica pica hudsonia* (Sabine)—Magpie.

Magpies were abundant and were seen every day and in every possible locality, though never in flocks but usually singly or in pairs. Their highly contrasting plumage of white and glossy black was a conspicuous feature of the otherwise more or less dull background of leafless trees in the valleys though none the less marked against the dark green of the conifers higher up on the hillsides. Their harsh voice was also very evident and consisted chiefly of a call or alarm note resembling the syllables "cack-cack-cack-cack-" repeated rapidly and at frequent intervals. The birds' other notes were too varied to bear reproduction but were somewhat less harsh in tone and at times sank to an even softer whistle that was not at all unpleasing. The bulky nests of the species were at this season of the year prominent objects in the trees everywhere. The birds are heartily disliked for their thieving habits and their fondness for eggs and young chickens and are shot at all times by the ranchmen. They are extremely wary on this account and hard to approach. The single specimen that I secured was obtained only because the bird was so busy "singing" that he failed to notice my approach.

18. *Nucifraga columbiana* (Wilson)—Clarke Nutcracker.

The Clarke Nutcracker or Clarke Crow was one of the first birds I saw on my trip. While I was driving out to the ranch house where I made my first headquarters, one of these birds flew across the road in front of the horses. It

reminded me of nothing so much as a young Red-headed Woodpecker in that its flight was markedly woodpecker-like and its grayish body and head and its black wings and tail with white on secondaries gave it, at least superficially, a very close resemblance to the bird mentioned. The next day I saw a single individual which was sitting in the top of a tall pine and uttering its peculiar "charr-charr," a note totally distinct from that of any other bird I have ever heard. The following day, November 29, I saw a pair and secured one of them. All the occurrences of this bird noted were at the heads of the canyons on the high plateau.

19. *Cyanocephalus cyanocephalus* (Wied)—Pinion Jay.

The Pinion Jay is even more thoroughly disliked by the ranchmen than is the magpie. It is abundant and goes about in flocks of many hundreds and even thousands. These flocks will alight upon grain fields and, the ranchmen claim, materially injure the crops in a very short time. The birds are not particularly wary but are somewhat difficult to approach at times owing to their restless nature which keeps them constantly moving. I have been standing in the line of approach of a flock of Pinion Jays and had them settle all around and within a foot or two of me and not show the least sign of fear when I moved around among them. They would turn and peer at me and were full of curiosity. Even when I shot they would merely rise, wheel around with loud outcries for a moment or so and then settle down and continue their activities as if nothing had happened to disturb them. Their high, nasal "kree-kree-" or "karee-karee-", repeated rapidly many times in succession or long drawn out, was a very familiar sound. The birds were seldom seen in the deciduous growth but seemed to prefer to keep to the pine covered hills, and there their dull bluish and faint white coloration showed rather prettily against the dark green foliage.

20. *Sturnella neglecta* Audubon—Western Meadowlark.

November 27 numbers of these birds were in evidence around Crawford. None were seen on the high plateau, and when I returned to Crawford the ones which had been there were gone, probably driven away by a blizzard which had raged a few days before.

21. *Hesperiphona vespertina montana* Ridgway — Western Evening Grosbeak.

I noted this bird on two occasions. The first occurrence was on December 7, on which date I saw a flock of them along the White river but was unable to approach the birds, and in the absence of a specimen referred them to this form only provisionally. On December 10, while exploring a little canyon north of Saddle-back butte, I heard the call note of the species, which faintly suggested that of the Purple Finch, and discovered one of the birds in the top of a tree just above me. I secured it but in doing so startled from its perch another which I had not seen. I obtained this specimen also and it proved to be the mate of the one first taken. The specimens might be referable to either typical *vespertina* or its variety *montana,* being practically intermediate in regard to size of wing and bill, although they come a little closer to *montana,* while in the width of the frontal band the tendency is also in that direction. These facts taken in conjunction with the geographical situation of the locality and its accompanying preponderance of western subspecies, leave little doubt in my mind as to the variety to which these two birds should be referred. This record adds a new bird to the Nebraska list as no specimens approaching this form have heretofore been taken.

22. *Pinicola enucleator montana* Ridgway—Rocky Mountain Pine Grosbeak.

Two male pine grosbeaks decidedly referable to this form were obtained on November 30, and form the basis for the inclusion of this bird in the Nebraska list. They were taken from a flock of about twenty-five which were in the top of a pine tree busily engaged in devouring the larvae of an injurious sawfly, the depredations of which were the cause of my being in that part of the state on field work. The birds first drew my attention by their peculiar chirping or chattering, a distinctive enough note when once recognized. The birds themselves are rather inconspicuous except for their white wing bars and their rather large size. December 9, while at Glen, I saw an additional pair which like the flock observed before was at the highest part of the ridge.

23. *Carpodacus cassini* Baird—Cassin Purple Finch.

A third species to be added to the Nebraska list is the

Cassin Purple Finch. It was recorded formerly from Sioux county by J. B. White who failed, however, to corroborate his statements with the evidence of actual specimens. I observed the birds on December 7 and 8 and secured two specimens, both males, on the first mentioned date. With one exception the birds seen were associated with Redpolls. The species is easily recognized in the field by the brighter purplish hue of the crown in contrast to the duller shade of the back. The bird's call note seems to be a chirp best represented by the syllables "to-wheat-to-wheat-" uttered in a rather leisurely manner and not particularly penetrating in quality.

24. *Loxia curvirostra minor* (Brehm)—Crossbill.

Crossbills were moderately common in the coniferous growth. Five specimens taken December 2, 4, and 10 are referable to this form rather than to *L. c. stricklandi,* although several of them exceed the maximum measurements of *minor* in one or more particulars. Most of these birds as well as many found in eastern Nebraska would fit nicely into the diagnosis of *L. c. bendirei* Ridgway and I should refer them to that subspecies had the A. O. U. committee seen fit to accept it as distinct. As it is the birds must be called *minor* although they are not typical.

25. *Loxia curvirostra stricklandi* Ridgway—Mexican Crossbill.

A single female taken December 4 should probably be referred to this form as it has a wing measurement of 94 mm. and culmen of 20 mm.

26. *Leucosticte tephrocotis* Swainson — Gray-crowned Rosy Finch.

The Gray-crowned Rosy Finch or Leucosticte was not common. I secured a single female along the White river on December 7. The only other representatives of the species I found were noted December 10. On that day I watched a flock composed of more than three hundred birds. They were flying around and wheeling in great curves, just skimming the ground as if preparatory to alighting and then rising suddenly, turning and allowing the light to catch and reflect the rosy tinge of their under parts much as the white underparts of a flock of sandpipers flash suddenly into view as the birds skim the water of some little pond.

27. *Acanthis linaria* (Linnaeus)—Redpoll.

Redpolls were abundant in the deciduous growth along the White river and the streams flowing into it. None were seen on the plateau or higher in the canyons than the deciduous growth extended. Several specimens taken all prove to be typical *linaria*.

28. *Astragalinus tristis pallidus* (Mearns)—Pale Goldfiinch.

Goldfinches, like the Redpolls, were seen only in deciduous timber. No specimens were taken but the birds observed all had the wing bars of maximum width and evidently belonged to the western form which is the resident one in that section of the state. They were but moderately common; not nearly so numerous as the Redpolls.

29. *Zonotrichia querula* (Nuttall)—Harris Sparrow.

On December 6 while working the White river valley I was very much surprised to see a Harris Sparrow. I was unable to secure the specimen that day but did so on the day following when I found it in about the same locality and again in a flock of tree sparrows. The record is interesting from a double standpoint. The species has not previously been recorded west of Cherry county while in addition it is not known to winter except in southern Nebraska. A wintering individual from Dawes county is therefore, to say the least, unusual.

30. *Spizella monticola ochracea* Brewster — Western Tree Sparrow.

Western Tree Sparrows were seen twice on the plateau and every day along the White river where they were abundant.

31. *Junco aikeni* Ridgway—White-winged Junco.

This species was the most abundant bird in the region visited. The juncos occurred in flocks of greater or less extent and were distributed over the high ridge as well as down in the river valley.

32. *Junco hyemalis connectens* Coues—Shufeldt Junco.

Shufeldt Juncos were moderately common and were associated with the White-winged Juncos. Almost every flock of the latter, especially in the lower valley, contained one or more individuals of the present species, which were immedi-

ately distinguishable from the white-winged form by their black heads, rufous backs and pinkish sides as well as by their lack of conspicuous wing bars. Several specimens were secured.

33. *Junco hyemalis mearnsi* Ridgway—Pink-sided Junco.

In the flocks containing the White-winged and Shufeldt Juncos there were individuals of still another form present. These were the Pink-sided Juncos. They were not so abundant as the Shufeldt Juncos but were not uncommon. Their pale, ashy heads served to separate them distinctly from the last named form, while their broadly pinkish sides and lack of wing bars prohibited their being confused with the white-winged species. The pinkish coloration was even more extended than in *connectens*. Three specimens were secured November 2 and December 3 and 8, and represent the first definite evidence for the inclusion of this bird in our fauna. The species was at one time included in our list on the strength of a junco, taken at Lincoln by a student in the taxidermy class, March 11, 1895, but the specimen was lost and its identity doubted and for this reason has been excluded. With the evidence now at hand, the species can be reinstated.

34. *Melospiza melodia* (Wilson)—Song Sparrow:

A specimen of song sparrow taken December 7 seems to be identical with true *melodia*. The same species was taken at Crawford December 12, 1895 by Professor Bruner.

35. *Melospiza melodia montana* Henshaw — Mountain Song Sparrow.

December 7 I took a specimen of song sparrow which is decidedly referable to the western or mountain form. The specimen, an adult male, has a bill with basal depth of only 6.8 mm. while the average of eight eastern Nebraska males of *M. m. melodia* is 7.88 mm. The other characters are also well in accord with those of the present subspecies. The bird taken first attracted my attention by its nervous actions which reminded me very much of those of a Winter Wren. It kept up a continual chirping which bore some resemblance to the note of an English Sparrow but was decidedly more musical. The capture of this specimen definitely adds still another new bird to our list.

36. *Pipilo maculatus arcticus* (Swainson)—Arctic Towhee.
A single Arctic Towhee was seen in Squaw canyon on December 4. The bird is a common summer resident and breeder in this region but seldom winters.

37. *Bombycilla garrula* (Linnaeus)—Bohemian Waxwing.
The only bird of this species noted was secured along the White river, December 8.

38. *Lanius borealis* Vieillot—Northern Shrike.
I saw this bird twice. The first occurrence was in Squaw canyon December 4 and the second at Glen, December 9.

39. *Certhia familiaris montana* Ridgway — Rocky Mountain Creeper.
December 3 I saw a pair of these birds in Squaw canyon but was unable to secure them as they were in a situation where I did not care to shoot. The birds were noticeably different from typical *C. f. americana* in their larger size and the much purer white of their under parts as well as by the somewhat brighter coloration of the rump. These two individuals were the only representatives of the species that I saw.

40. *Sitta carolinensis nelsoni* Mearns—Rocky Mountain Nuthatch.
On three occasions I found this nuthatch, November 30 and December 1 and 10, and on each occasion the birds were in pairs and in the higher localities, on the ridge or on the summits of the buttes. None were seen in the deciduous growth of the lower valley. Several specimens were taken, all referable to this form.

41. *Sitta canadensis* Linnaeus—Red-breasted Nuthatch.
The Red-breasted Nuthatches, although reported to be uncommon winter residents of the state were common in the vicinity of Squaw mound. Every day during my stay on the top of the ridge I saw these active little fellows and in every case they were found in a flock of Long-tailed Chickadees. Almost every flock of the chickadees had one or more of these visitors and if they were not at once seen, a moment's listening would result in hearing their characteristic nasal call. I found none of the birds in the valley.

42. *Penthestes atricapillus septentrionalis* (Harris) — Long-tailed Chickadee.

Long-tailed Chickadees were almost as abundant as the White-winged Juncos, if not fully so. Only a few individuals together at a time, yet they were everywhere. They were exceedingly tame and full of curiosity and would come up as close to me as they dared and watch me closely. One little fellow, I remember in particular, followed me up Squaw canyon for a quarter of a mile or so and finally had the temerity to fly up and perch on the barrel of my gun within a foot or two of my head. How long it would have remained there I cannot say for its perch was so slippery as to make it necessary for the bird to find a more secure footing and it flew off.

43. *Saxicola aenanthe leucorhoa* (Gmelin)—Greenland Wheatear.

Under this caption I am obliged to record one of the most severe disappointments I have experienced in field work. On the morning of December 2, I was exploring the ridge north of Squaw mound when my attention was attracted by a bird some distance down the southern slope. It was hovering over the ground and would remain for a short time almost motionless except for the rapid beating of its wings. Suddenly it would drop to the ground where it would stay for a little while, and then rise, fly for a short distance and repeat the performance. It did this several times while I watched it and in doing so gradually drew nearer. It suddenly became aware of my presence, however, and sought a perch on a fence post well out of range. All efforts to approach it were useless as it kept pace with my movements and I was forced to have recourse to my field glasses and note-book. I then began another series of attempts at approach but without success. After a weary chase the bird took to the canyons where it succeeded in finally eluding me. I regret very much that I was unable to secure the specimen as the species is not only new to Nebraska but is extremely rare in the country, although it has been taken in New York, Maine, Michigan, Louisiana and Colorado. In the absence of more definite data, although I am sure of the identity of the bird I saw, the species cannot be included in our fauna positively.

Vol. V, Part 3 April 29, 1911

PROCEEDINGS OF THE
NEBRASKA ORNITHOLOGISTS' UNION

MISCELLANEOUS NOTES

THREE INTERESTING MARCH RECORDS.—During the month of March, 1911, the following three records have come to my notice:

Eskimo Curlew (*Numenius borealis*). On March 22, 1911, while Mr. Fred Geiger was duck shooting in a blind near Waco, York county, two of these birds came flying by within gun range and both were shot by him. The identity of the birds was not at once recognized but later they were named by an old-time hunter and were then brought to Lincoln for mounting, in this way coming to my notice. Both birds were females, with well developed ovaries. This record is particularly interesting, dealing as it does with a species which has not been collected in the state for many years past, and of which grave doubts have been expressed that any still exist alive anywhere (see Cooke, Bulletin 35, Biological Survey, p. 76).

Harlan Hawk (*Buteo borealis harlani*). On March 28, 1911, a fine male of this species was shot at Ceresco, Saunders county. It came into my hands for mounting and is now in my collection.

Cinnamon Teal (*Querquedula cyanoptera*). While hunting at the lakes near Shickley, Fillmore county, on March 30, 1911, Mr. Henry Clarke, Jr. shot a teal coming in at a great height and it proved to be a fine male of this species. It came into the possession of Mr. Harry Harley of Lincoln, for whom I have mounted the specimen.

August Eiche, *Lincoln.*

ON TWO NEW SCOTER RECORDS AND THE EASTWARD RANGE OF THE PINION JAY.—On November 1, 1910, at Cody lake near Cody, Cherry county, Mr. George A. Turner shot a young male White-winged Scoter (*Oidemia deglandi*), and an adult female Surf Scoter (*Oidemia perspicillata*), and, not recognizing the species he gave them to Mr. J. F. Parks of Hot Springs, South Dakota, who sent them to me for mounting. These two ducks are now the property of Mr. Parks at Hot Springs. Both species have previously been recorded from Lincoln and Omaha, but records of Scoters in Nebraska are always interesting.

During the month of November and in early December, 1910 a flock of Pinion Jays visited the grounds of the Norfolk Asylum. One was shot and brought me to be mounted. While the bird is common in the western part of the state, I feel quite sure that they seldom visit as far east as Madison county, as I have never seen them here before and jays are usually in evidence when anywhere in the neighborhood.

L. Sessions, *Norfolk.*

PINE GROSBEAKS AND BOHEMIAN WAXWINGS AT LINCOLN.—During the winter just passed flocks of these two birds were seen repeatedly in the small grove of cedars about the Superintendent's residence on the University Farm Campus. The Pine Grosbeaks (*Pinicola enucleator leucura*) were first noted by Swenk on November 7, 1910, when a flock of thirty or forty alighted in the cedars, remaining only a few minutes but yet long enough to enable complete identification. Smaller flocks were again noted on November 15 and November 21 by both Swenk and Zimmer. The Bohemian Waxwings (*Bombycilla garrula*) were first seen by Zimmer on November 8, 1910; then none were noted until February 22, 1911, when a flock of twenty-three were noted by Swenk, they remaining in the cedars for several hours. They were noted for the last time on March 6 by Swenk.

Myron H. Swenk and J. T. Zimmer, *Lincoln.*

SOME BIRD NOTES FROM LINCOLN COUNTY.—Little Brown Crane (*Grus mexicanus*).—A record for this bird was made by the identification of a head and foot which was brought to me by one of the pupils of the North Platte High School. She secured these parts of the bird from Dr. Drost, a resident of the city. When questioned the Doctor said he was shooting ducks over decoys on a slough north of the North Platte River. A flock of about fifty birds came in over

the decoys and in the twilight and from the position of the hunter they were so indistinctly seen as to be mistaken for game birds. One bird fell at the first shot and the flock rose. The bird was brought to town and only the head and foot were saved, these being now in the collection of Mr. J. T. Zimmer of Lincoln. The bird was shot March 14, 1911.

White-winged Junco (*Junco aikeni*).—A specimen was secured December 26, 1910, from a flock of about twenty-five which made their headquarters in a neighbor's yard. They seemed to be seen there oftenest, chirping among some low trees and often feeding from the ground. The same birds were seen on nearly every day for about six weeks during the winter.

Redpoll (*Acanthis linaria*).—January 28, 1911, a flock of redpolls settled in the trees near my home and spent several hours talking to each other while feeding among the weeds and vegetable stalks of my last year's garden. They were very tame. I did not take a specimen as my glasses were sufficient to identify them. They were seen in different parts of th city on occasions during the month but disappeared before the first of February.

Lapland Longspur (*Calcarius lapponicus*)—On the evening of January 12, 1909, I spent some time in the evening listening to some birds which were flying around in the darkness. Their twitter was characteristic and attracted me. It was about nine o'clock that I heard them. It was snowing very lightly and the birds seemed to be flying in the storm. Later the snow turned to sleet and rain and still later it snowed a little more. In the morning I found a Lapland Longspur near the back door of my home. Later I found several more. They were not dead but seemed to be frozen or chilled by the rain, sleet and snow. When the school children came to school they brought many individuals. After being in a warm room for a while most of the birds revived but those which were left out on the ground died. I counted the number of dead birds on a vacant lot and then estimated the number of birds which died from the exposure of that one night in the city at 10,000. There were no reports of dead birds outside of town although inquiry was made from a number of people. Most of the birds were found in those parts of the city where the streets were lighted.

Wilson Tout, *North Platte.*

SOME RESULTS OF FOUR YEARS' OBSERVATION AND COLLECTING CHIEFLY IN THE VICINITY OF LINCOLN. —The following records and notes were all made at Lincoln, Lancaster county, unless otherwise stated:

Western Grebe (*Aechmophorus occidentalis*).—On October 23, 1909, I watched a pair of these birds for some time at the lake west of the city. They were very clearly seen although they kept well off-shore.

Caspian Tern (*Sterna caspia*).—A flock of twelve Caspian Terns was observed on May 2, 1908, at the lake. At times they flew directly over me and I was able to make the identification certain.

Wood Duck (*Aix sponsa*).—Twice I have noted Wood Ducks, once on June 14, 1907, and again on October 10, 1908. On both occasions the birds were paired.

King Rail (*Rallus elegans*).—On May 30, 1910, Dr. R. H. Wolcott and myself found this bird breeding at Lincoln. On that date a nest containing seven eggs was found in the center of a wild rice swamp. Several individuals of the species were seen the same day and also later in the same locality but only the one nest was located.

Yellow Rail (*Coturnicops noveboracensis*).—I have a female of this species which I took at South Bend, Cass county, on May 8, 1909. I observed two individuals on April 30 of the same year near Lincoln but was unable to secure a specimen.

Northern Phalarope (*Lobipes lobatus*).—I have the following dates for this species: May 11, 1907, May 14, and 24, 1910.

Red-backed Sandpiper (*Pelidna alpina sakhalina*).—Formerly common, this species has of recent years been seen on but few occasions. In the spring of 1910, however, numerous individuals were seen by different observers. I found them on May 7 and 14 and June 9 of that year.

Marbled Godwit (*Limosa fedoa*).—This is another species uncommon of late years. I saw a single one on May 28, 1910.

Hudsonian Godwit (*Limosa haemastica*).—On June 12, 1910, Dr. R. H. Wolcott and I found a Hudsonian Godwit at Ceresco, Saunders county. The bird was associating with a pair of Killdeers, whose nest was found, but no mate was seen, and it was undoubtedly merely a straggler. The specimen was taken and proved to be a female.

Buff-breasted Sandpiper (*Tryngites subruficollis*).—I secured the male of a pair of this species at Waverly, Lancaster county, on the early date of August 14, 1909.

Swallow-tailed Kite (*Elanoides forficatus*). —July 14, 1905, I watched a pair of these birds as they circled around in the air. The locality was a few miles north of Lincoln.

Goshawk (*Astur atricapillus*).—A single individual of the Goshawk was noticed November 16, 1907.

Richardson Owl (*Cryptoglaux funerea richardsoni*). —I saw a Richardson Owl on October 19, 1907. The bird was perched on a low shock of grass near a patch of woods along Salt Creek and allowed me to approach to within a few feet without taking fright. Even then it did not seem to see me, although it was beginning to grow dusk, but became alarmed by the snapping of a twig on which I inadvertantly stepped and took wing, flapping slowly across the creek.

Olive-sided Flycatcher (*Nuttallornis borealis*).—At Roca, Lancaster county, on September 4, 1909, Mr. M. H. Swenk and myself noted a bird of this species which I secured. It was a female.

Yellow-bellied Flycatcher (*Empidonax flaviventris*). —On May 21, 1910, Dr. R. H. Wolcott and I observed Yellow-bellied Flycatchers south of Roca but were unable to secure a specimen.

Alder Flycatcher (*Empidonax traillii alnorum*).—I have two specimens of this flycatcher, which has not been included heretofore in the list of Nebraska species. One of the specimens, a male, was taken at Lincoln on May 20, 1909, and the other, a breeding female, was secured at Union, Cass county, on July 23, 1910.

Horned Lark (*Otocoris alpestris*). —On December 24, 1908, I obtained a specimen of the true *O. alpestris* from a flock of *O. a. praticola*. The bird was singled out of the flock almost immediately on account of its larger size and its more extended yellow markings.

Meadowlark (*Sturnella magna*).—On three occasions, November 14, 1908, April 9, 1909, and February 23, 1911, I have seen and heard meadowlarks which I could not satisfactorily call *S. neglecta* both on account of their markings and their song, which latter was radically different from that of the western species. A male which I secured on April 9, 1909, proved to be easily referable to *magna*.

Leconte Sparrow (*Passerherbulus lecontei*).—As a particularly early record for the Leconte Sparrow I have a specimen which I obtained on March 17, 1909.

Nelson Sparrow (*Passerherbulus nelsoni*).—The Nelson Sparrow was noted by Dr. R. H. Wolcott and myself on May 30, 1910, near Waverly, where several individuals were seen and two females were secured. The birds were in a low, wet, grassy piece of country and were never seen except when flushed, at which times they would rise and fly low, just clearing the top of the grass, and drop quickly out of sight.

Western Blue Grosbeak (*Guiraca caerulea lazula*).—I collected the nest and eggs of this bird at Lincoln on July 18, 1908. The set contained three eggs of the grosbeak and one of a cowbird.

Blue-headed Vireo (*Lanivireo solitarius*).—May 10, 1910, I secured a male of this species near Lincoln. It was the only one seen.

Prothonotary Warbler (*Protonotaria citrea*).—I found this warbler as far west as South Bend on May 8, 1909.

Northern Parula Warbler(*Compsothlypis americana usneae*).—I have seen this bird on September 9, 1908 and April 4, 1909 at Lincoln and on April 30, 1910, at Child's Point, Sarpy county. A female was secured on each of the first two occasions.

Magnolia Warbler (*Dendroica magnolia*).—I have three specimens of this warbler, two males taken on May 25, 1909, at Lincoln and May 19, 1910, at Child's Point, and a female secured May 26, 1909, at Lincoln.

Blackburnian Warbler (*Dendroica fusca*).—I noted an individual of this species May 25, 1909.

Kentucky Warbler (*Oporornis formosus*).—This warbler was found as far west as Lincoln where I collected a female on May 12, 1909.

Mourning Warbler (*Oporornis philadelphia*).—On May 25, 1909, I secured a pair of Mourning Warblers at Lincoln and on September 4 of the same year obtained an immature female at Roca.

Hooded Warbler (*Wilsonia citrina*).—This bird was noted on May 12.

Wilson Warbler (*Wilsonia pusilla*) and Pileolated Warbler (*W. p. pileolata*).—I have seen the Wilson Warbler on May 11, 1907, May 18, 1909 and September 8, 1909. On September 4, 1909, at Roca I secured three specimens of this species one of which seems referable to the western subspecies because of its much brighter coloration, especially on the forehead.

All three of the specimens were males. This is the first definite evidence for including *pileolata* in the list of Nebraska forms.

Canada Warbler (*Wilsonia canadensis*).—May 26, 1909, I watched a bird of this species for some time but was unable to approach it.

Carolina Wren (*Thryothorus ludovicianus*). —The records which I have for the Carolina Wren are April 12, 1909 at Lincoln and May 8 of the same year at South Bend.

Winter Wren (*Nannus hiemalis*).—I have the following dates for this bird: November 28, 1907, December 27, 1907, February 14, 1908 and October 17, 1908. I secured a female on the second mentioned date and a male on the last one.

Short-billed Marsh Wren (*Cistothorus stellaris*).—A male of this species was obtained October 1, 1910.

Chickadee (*Penthestes atricapillus*). –November 28, 1907, I secured a female evidently referable to true *atricapillus*.

Golden-crowned Kinglet (*Regulus satrapa*).—I have taken this bird as late as November 27, 1908.

Townsend Solitaire (*Myadestes townsendi*)—I have a female which I obtained December 7, 1907. It has been reported at Lincoln during the winter several times.

Willow Thrush (*Hylocichla fuscescens salicicola*). —This bird has been seen twice, once at Lincoln May 25, 1909, and again at Roca May 21, 1910. A female was obtained on the first mentioned date.

Hermit Thrush (*Hylocichla guttata pallasi*).—I have seen seen this bird twice, on April 20, 1907, and on October 10, 1908, on which latter date a male was collected.

J. T. Zimmer, *Lincoln.*

THE TOWNSEND SOLITAIRE WINTERING IN WEBSTER COUNTY.—On January 7, 1911, I collected a specimen of the Townsend Solitaire (*Myadestes townsendi*) at Red Cloud. This is the first record for the south central part of the state.

J. M. Bates, *Red Cloud.*

RECORDS OF SOME RARE BIRDS IN NEBRASKA.—The following records of the occurrence of several species of rare birds in this state are worthy of note:

Gray-headed Junco (*Junco phaeonotus caniceps*).—On April 19, 1911, Mr. Chas. S. Ludlow of Red Cloud, Webster county, took the first specimen of this species to be definitely recorded for the state, though in the "Birds of Nebraska" the statement is made that it was expected to occur in western Nebraska in winter. Concerning the taking of this specimen, Mr. Ludlow says that there had been a thunder-storm the night before, and the morning was clear, with a cold north-west wind. The bird was first seen in a peach tree, singing a low, sweet song somewhat resembling that of the Tree Sparrow, and from the tree it flew to the ground, where he watched it from a distance of not over twenty feet while it scratched around. It then flew to a brush pile, joining a flock of Tree Sparrows, and here Mr. Ludlow shot it. It is the only specimen of the species he has ever seen. The specimen is now in the collection of Mr. J. T. Zimmer of Lincoln.

Western Grebe (*Aechmophorus occidentalis*).—A specimen of this grebe was taken by Mr. A. L. Wilson, a ranchman, at Horseshoe lake, Lincoln county, November 10, 1908, and is now in the collection of Mr. August Eiche of Lincoln.

Cinnamon Teal (*Querquedula cyanoptera*).—A male was shot by Mr. Charles Armstrong at Greenwood, Cass county, May 4, 1909, being one of two specimens seen.

Northern Phalarope (*Lobipes lobatus*).—A pair in full breeding plumage was taken by Mr. George Pinneo at Lincoln, June 6, 1908.

A Magnolia Warbler (*Dendroica magnolia*) was observed by the writer at Omaha, May 10, 1908, and a Canada Warbler (*Wilsonia canadensis*) was seen on the same day and in the same locality, Child's Point.

Robert H. Wolcott, *Lincoln.*

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PROCEEDINGS OF THE

NEBRASKA ORNITHOLOGISTS' UNION

SOME NOTES ON THE SUMMER BIRDS OF SOUTHWESTERN NEBRASKA

BY M. H. SWENK AND J. T. ZIMMER

The western edge of the extreme southern part of the state of Nebraska, embracing Dundy, Chase and Perkins counties, or the area between the fortieth and forty-first parallel and the fourth and fifth guide meridian west, has been on the whole but poorly studied ornithologically, especially as regards the migrating birds, and so far as known to us no ornithologist has made observations on the migrants of this portion of the state. Our knowledge of the winter birds is largely gained from observations made on a one day trip from Wray, Colorado, and Haigler, Nebraska, November 16, 1901, by L. Bruner and R. H. Wolcott. The co-authors of this paper have both visited the region under discussion in the early summer and made close observations on the summering birds. Swenk first visited the region in July 1903, when, in company with L. Bruner, bird observations covering three days, the 23 to the 25, were made along the line of the Burlington from Max to Haigler. Again, in 1905, Swenk spent a week in the region, driving over the plateau from Ogallalla, Keith county, to Imperial, Chase county, and collecting around Imperial, Culbertson, in Hitchcock county, and Haigler, in Dundy county. Zimmer arrived at Grant, Perkins county, on June 30, 1911, and the next day drove across country to Imperial, leaving Imperial on July 3 and spending July 4 to 11 exploring the region about Haigler.

The area under discussion lies in the plains region of the state, but there is at places a tendency toward sandhill formation, especially north of Haigler, east of Imperial and east and

south of Grant. At other places, especially in Perkins and Chase counties, there are no real sandhills and the plateau is covered with typical plains vegetation. There is no stream of any size in Perkins county; in Chase county the largest river is the Whiteman's Fork of the Republican, or as it is called thereabouts, the Frenchman; Dundy county is crossed in the southern part by the Middle Fork of the Republican or the Arickaree. Whiteman's Fork is a small stream, narrow enough to leap across at many points and flowing through a treeless valley. The Arickaree is rather broad but the farmers along its course so deplete the supply of water for irrigation purposes that the bed is almost dry before it reaches the Kansas-Nebraska line. The season of 1911 was excessively dry, and at the time of these observations there was no running water, only a few pools here and there fed by springs and not over a foot or so in depth, usually less. In 1903 and 1905, which seasons were characterized by more rainfall, there was running water in the river bed. In places along the Arickaree there are scattered clumps of trees, and willow covered "islands" are not infrequent. The presence of even this thin tree growth has a profound effect upon the species of birds one is apt to meet, and, as the following list and annotations will show, is a pathway which eastern species are following in extending their range to the westward. The lower valleys in the river bottom are covered with high grass, with here and there a reedy marsh, but these latter were largely dried out in 1911. Back from the river valley one comes at once to treeless hills covered with sagebrush, yucca and cactus, varied with blowouts where the soil is sandy, and not infrequently, along the margin of the river bed, eroded into more or less prominent bluffs and buttes.

While the total numbers of species observed, fifty-three, is not large, it is believed to represent practically all of the species present in the summer season, except occasional stragglers, and includes all of the common breeders in the region. It adds considerable definite knowledge of the exact distribution of many of our birds and shows pretty clearly the character of the shifting of ranges of the various species in this part of the state within the past decade.

1. *Querquedula discors* (Linnaeus)—Blue-winged Teal.

A pair of these ducks was flushed from a pond a few miles south of Grant, June 22, 1905, by Swenk.

(*Olor buccinator* (Richardson)—Trumpeter Swan.

On June 22, 1905, while riding on the mail stage from

Ogallala to Grant, a fellow passenger living near Ogallala told Swenk of having seen three swans that morning on the Platte river near town. He stated that he believed that the birds were nesting somewhere in the vicinity. Earlier in the season there had been four of these birds, but several days previously, on June 14, this man had shot one of them and captured it alive. He stated that the wounded bird was being kept alive at a farm house near Hershey. The three surviving birds were being kept under surveillance by a ranchman named Stansbury, who was searching for the nest. Swenk did not have an opportunity to verify this report, but as swans are known to have formerly nested in western Nebraska the apparently disinterested statements of this man have great plausibility.)

2. *Botaurus lentiginosus* (Montagu)—Bittern.
On July 5, 1911, Zimmer flushed a pair of bitterns from the river bottom near Haigler where they had been concealed in a clump of reeds.

3. *Helodromas solitarius* (Wilson)—Soiltary Sandpiper.
Evidently a summer resident, though its breeding in this region is doubtful. One was noted on a sandbar in the Republican near Benkelman by Swenk, July 23, 1903, and several individuals were seen along the Arickaree near Haigler by Zimmer, July 5, 6, and 7, 1911.

4. *Bartramia longicauda* (Bechstein)—Upland Plover.
Both Swenk and Zimmer found these birds common on the plateau between Grant and Imperial, June 22, 1905, and July 1, 1911. On the latter date Zimmer found these birds the most plentiful of all the species present and usually the only ones in sight back in the hills south of Imperial miles away from water. Often in approaching too near a nest for the continued peace of mind of the owners they would rise in the air, circling closely around with rapid wing-beats and giving their simple liquid call perhaps a little more rapidly than usual. Once the danger was past with a querulous note or two the birds would settle back to reassure themselves that all was safe. At Haigler Swenk heard these birds flying over during the night of July 24, 1903, and Zimmer saw six of them July 7, 1911, some distance west of town.

5. *Oxyechus vociferus* (Linnaeus)—Killdeer.
A common bird of the region. Swenk found birds with

young unable to fly at Grant, June 22, 1905, Zimmer saw several at Imperial July 1 and 2, 1911, and the species was found commonly along the Arickaree from Benkelman to Haigler, July 23 and 24, 1903, by Swenk, and about the little pools of water in the almost dry river bed at Haigler, July 4-11, 1911, by Zimmer.

6. *Colinus virginianus* (Linnaeus)—Bob-white.

Bob-whites were rather abundant along the Arickaree at Haigler, especially during 1911, when they were found every day by Zimmer from July 4 to 11 in flocks of greater or less size, each flock evidently composed of the members of a single family. When surprised these flocks would scatter in every direction, although the young were barely able to fly. Swenk noted them at the same place June 26, 1905. Zimmer saw Bob-whites between Grant and Imperial July 1, 1911, but Swenk did not note this species when going over the same ground in 1905. Evidently the dry season of 1911 favored the increase of this bird.

7. *Tympanuchus americanus* (Reichenbach)—Prairie Chicken.

Prairie Chickens were noted by Swenk between Grant and Imperial, June 22, 1905, and at one place along the road the buggy passed within a foot and a half of a hen which was squatting immovably, with all her feathers drawn close, between two clumps of grass. Only when the buggy was stopped and the bird nearly touched would she flush, and when she did so over a dozen downy young scattered through the grass, calling confusedly. Zimmer flushed a Prairie Chicken from a grass-grown hollow near the river at Haigler July 9, 1911.

8. *Zenaidura macroura carolinensis* (Linnaeus) — Mourning Dove.

Abundant. Noted by both Swenk and Zimmer at Imperial, June 23, 1905, and July 1-2, 1911, respectively, and from Max to Haigler, July 23, 1903, by Swenk. Zimmer found it abundant at Haigler, July 4-11, 1911, also.

9. *Cathartes aura septentrionalis* Wied—Turkey Vulture.

A Turkey Vulture was noted by Swenk near Haigler, July 24, 1903, and on both July 5 and 8, 1911, Zimmer noted a pair of them sailing about overhead at the same place.

10. *Circus hudsonius* (Linnaeus)—Marsh Hawk.

Zimmer saw this species at Imperial on July 1 and 2 and at

Haigler from July 7 to 11, 1911. On July 8 he found the nest of a pair of these birds in a swamp near Buffalo creek, several miles east of Haigler, and flushed the hawks themselves nearby. The birds were all on the wing and the nest, therefore, was empty, but the parents showed as much anxiety during his exploration of the swamp as though the nest had contained eggs or nestling young.

11. *Buteo swainsoni* Bonaparte—Swainson Hawk.
Swenk noted a dead hawk of this species along the road between Grant and Imperial, June 22, 1905. Two large hawks which he took to be this species were also seen circling about overhead.

12. *Archibuteo ferrugineus*(Lichtenstein)—Ferruginous Roughleg.
At Haigler, July 25, 1903, Swenk noted one of these hawks in the sandhills north of town, the bird allowing a very close approach, while Zimmer noted hawks of this species flying overhead at the same locality, July 5, 8, and 11, 1911. Near Imperial, July 1, 1911, Zimmer observed one perched motionless on a pile of boulders that marked the summit of a near-by hill.

13. *Falco sparverius* (Linnaeus)—Sparrow Hawk.
A pair of Sparrow Hawks were noted by Bruner at Max, July 23, 1903. This record is referred to the eastern form, though the birds may easily have been the desert form, *F. s. phalaena,* which is resident in Sioux county.

14. *Asio flammeus* (Pontopiddan)—Short-eared Owl.
One seen at Benkelman, June 25, 1905, by Swenk.

15. *Otus asio* (Linnaeus)—Screech Owl.
On July 9, 1911, in a little grove of willows near the swamp containing the Marsh Hawk nest, Zimmer found about a half dozen screech owls and secured a specimen. This bird, though somewhat paler than our eastern Nebraska screech owls, is unquestionably referable to the eastern subspecies and does not closely approach the Rocky Mountain form, *O. a. maxwelliae.*

16. *Spcotyto cunicularia hypogaea* (Bonaparte) — Burrowing Owl.
Both Swenk and Zimmer noted this owl commonly between Grant and Imperial, perched like so many statues on the fence posts and sleepily turning their heads to watch the

passing buggy and its occupants. They are mostly confined to the vicinity of the prairie-dog towns. Swenk noted them at prairie dog towns between Stratton and Max on July 23, 1903, and again several miles east of Haigler on the same day. Zimmer also found these birds at Haigler, and in the hills south of Imperial, on July 2, 1911, found a Burrowing Owl hunting in the broad daylight.

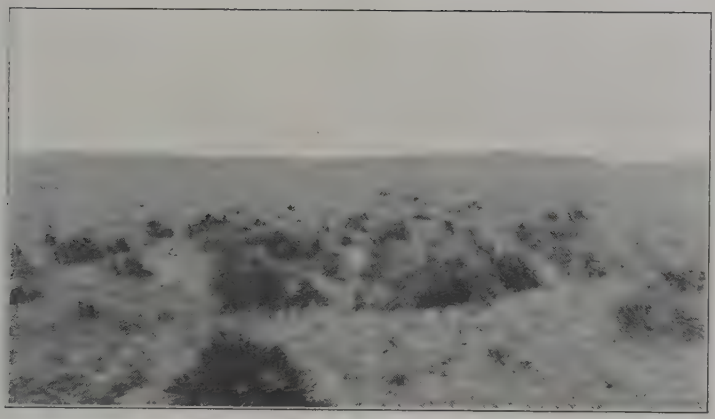
17. *Coccyzus americanus* (Linnaeus)—Belted Kingfisher.
On July 6, 1911, Zimmer saw three Yellow-billed Cuckoos some distance west of Haigler and attempted to collect one of them, but the bird escaped owing to the gun missing fire. Returning of a later date he found no trace whatever of the of extreme southwestern Nebraska is the California Cuckoo birds. It is highly probable that the Yellow-billed Cuckoo, *C. a. occidentalis,* which form is stated to be the common and almost exclusive summer resident and breeder over the whole state of Colorado up to the extreme eastern edge of the state, but the identity of these Haigler birds must remain an open question pending the securing of specimens.

18. *Ceryle alcyon* (Linnaeus)—Belted Kingfisher.
On July 25, 1903, Swenk noted a Kingfisher come flying down the Arickaree and into the town, alighting on a large water tank on the main street and spending some time peering into its depths. Zimmer noted the species at Haigler on July 6, 8, and 11, 1911.

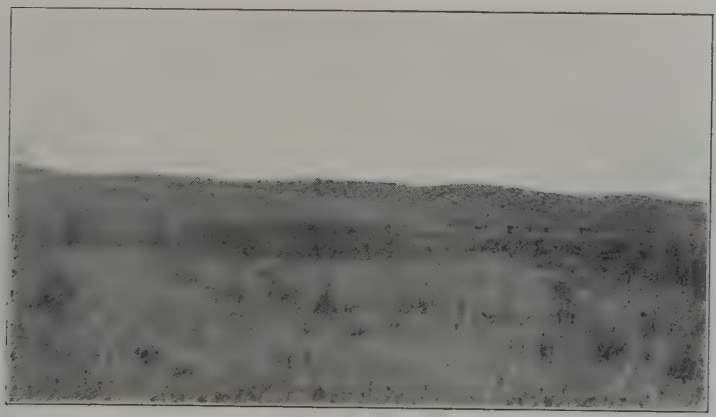
19. *Melanerpes erythrocephalus* (Linnaeus) — Red-headed Woodpecker.
Swenk noted this woodpecker at Ogallala, June 21, 1905, at Benkelman, July 23, 1903, and a pair at Haigler, July 25, 1903. Zimmer noted it but once, at Haigler, July 8, 1911, when a singe individual was seen.

20. *Colaptes auratus luteus* Bangs—Northern Flicker.
Moderately common at Haigler in 1911, where Zimmer noted it on July 6, 8, 9, and 10. On the last date he found an immature bird where it had hanged itself by getting its neck caught in the framework of a windmill tower where two supports came together in a sharply angled Y. It was quite recently dead when he found it.

21. *Colaptes cafer collaris* Vigors—Red-shafted Flicker.
Zimmer found this species rather less common than the preceding, but noted it at Haigler on July 4, 8, and 11.



Sage brush and yucca covered plains at the Nebraska-Colorado line west of Haigler, the dry bed of the Arickaree in the distance. July 10, 1911. J. T. Zimmer.



First rise of sandhills back from the bed of the Arickaree northeast of Haigler. July 11, 1911. J. T. Zimmer.

Swenk noted neither this nor the preceding at Haigler either in 1903 or 1905.

22. *Chordeiles virginianus sennetti* Coues—Sennett Nighthawk.
A common summer resident and breeder. Swenk noted it frequently on the high ground between Grant and Imperial and at Max, Parks and Haigler. Zimmer collected a male at Haigler, July 5, 1911. It renders itself conspicuous by perching on the tops of the fence posts during the day.

23. *Tyrannus tyrannus* (Linnaeus)—Kingbird.
Swenk noted this flycatcher at Haigler June 26, 1905, one bird only being seen, while in 1911 Zimmer found it rather common in the same locality, July 4-11.

24. *Tyrannus verticalis* Say—Arkansas Kingbird.
Swenk found this species common in Dundy county in 1903, especially eastwardly. At Max he noted five birds, at Benkelman two and at Parks one. He did not see it at Haigler either in 1903 or 1905, nor did Zimmer note it at Haigler in 1911.

25. *Sayornis sayus* (Bonaparte)—Say Phobe.
At Haigler, July 24, 1903, Swenk noted a pair of Say Phoebes and two years later, on June 26, 1905, he saw several different birds at that place. In 1911, Zimmer noted the bird there several times, and saw it also at Imperial, July 2, 1911. This flycatcher is quiet and rather shy, and its soft "pe-ur" or "whe-eer" is in keeping with its actions and appearance and in contrast to the vociferous and aggressive Kingbird.

26. *Otocoris alpestris leucolaema* (Coues)—Desert Horned Lark.
In 1903 Swenk found this bird very common in Dundy county, noting it at Max, Benkelman and Haigler; it was, in fact, one of the commonest birds in the region. In 1905 it was very abundant along the road between Ogallala and Grant, June 22, but in Dundy county it was almost absent. Zimmer did not find it much in evidence in 1911, and noted it but twice at Haigler, July 5 and 6.

27. *Cyanocitta cristata* (Linnaeus)—Blue Jay.
Not noted by Swenk in 1903 or 1905, but present, though not very common, at Haigler in 1911, several individuals being present which were noted July 6, 7, 8, and 11.

28. *Dolichonyx oryzivorus* (Linnaeus)—Bobolink.
Noted only once, a single bird in a valley near a large

ranch several miles north of Imperial, June 22, 1905. The bird was not present in the highlands.

29. *Molothrus ater* (Boddaert)—Cowbird.
Swenk noted a large number of cowbirds following the cattle on a large ranch in the sandhills north of Haigler, July 25, 1903, and Zimmer observed small flocks of these birds at Haigler from July 6 to 10, 1911.

30. *Xanthocephalus xanthocephalus* (Bonaparte)—Yellow-headed Blackbird.
At Haigler, July 25, 1903, Swenk noted Yellow-headed Blackbirds at three different places; a flock of two males and four females along the Arickaree, later three females along the same stream, and a large flock at a well in the sandhills north of town. Not noted by Zimmer.

31. *Agelaius phoeniceus* (Linneaeus)—Red-winged Blackbird.
Swenk noted several Red-winged Blackbirds in the valley north of Imperial where the Bobolink was seen, June 22, 1905, and also noted the species at Benkelman, July 23, 1903. Zimmer noted individuals every day from July 6 to 9 and on the 11th at Haigler, though the birds were not numerous.

32. *Sturnella neglecta* Audubon—Western Meadowlark.
Very common over the whole region. Noted by both Swenk and Zimmer at Grant, Imperial and Haigler, and by Swenk at Ogallala, Max, Benkelman, Parks, etc.

33. *Icterus spurius* (Linnaeus)—Orchard Oriole.
Heard singing but not seen by Swenk at Haigler, July 25, 1903, and noted by Zimmer at the same locality on July 4 and July 6 to 11, 1911.

34. *Quiscalus quiscula aeneus* Ridgway—Bronzed Grackle.
Zimmer noted this blackbird as not uncommon at Haigler in July, 1911, where he saw it practically every day from the 4th to 11th. Swenk did not see this bird either in 1903 or 1905.

35. *Astragalinus tristis pallidus* (Mearns)—Pale Goldfinch.
Swenk saw a single bird at Ogallala, June 21, 1905, and Zimmer saw individuals near the Arickaree at Haigler on July 4, 6, and 9, but the birds were not common.

36. *Ammodramus savannarum bimaculatus* Swainson—Western Grasshopper Sparrow.

On the plateau from Grant to Imperial, June 22, 1905, those sparrows were common, and Swenk noted them at Max and Benkelman on July 23, and at Haigler on July 24, 1903. Zimmer saw a few at both Imperial and Haigler, and took a specimen at the latter place on July 9, 1911.

37. *Chondestes grammacus strigatus* Swainson—Western Lark Sparrow.

Plentiful over the entire region, and apparently not confined to any one type of country. Noted by both Swenk and Zimmer at Grant, Imperial and Haigler, and by Swenk at Benkelman and Parks. Seen by both observers every day while in the region.

38. *Zamelodia melanocephala* (Swainson)—Black-headed Grosbeak.

Noted only once in the region, by Swenk at Benkelman, July 23, 1903.

39. *Guiraca caerulea lazula* (Lesson)—Western Blue Grosbeak.

Zimmer found this species rather common in the region under consideration, and the birds were fully as much at home on the almost barren sandhills as in the watered river valleys. In spite of the fact that they have a rather pleasing song, they were all more or less quiet at this time. While they usually nest at low elevations, in bushes and on weeds, they occasionally have higher ambitions for the observer found a nest, containing three eggs, placed twelve feet from the ground in the fork of a tree where a branch joined the main trunk. This nest was discovered at Haigler on July 6, 1911, and the bird was seen on or near the nest on several subsequent days. Swenk noted this bird at Haigler, July 25, 1903.

40. *Spiza americana* (Gmelin)—Dickcissel.

On the high plateau between Ogallala and Imperial, representing most of Perkins and Chase counties, the Dickcissel was not seen, except in the valley north of Imperial where one was seen by Swenk, June 22, 1905. Along the Arickaree it was noted at Max and Parks, July 23, 1903, one individual at the former place and two at the latter, by Swenk. Zimmer saw a single bird at Haigler on July 8 and 9, 1911. Obviously the Dickcissel does not flourish in this dry country, and occurs only in small numbers along the valleys of the streams.

41. *Calamospiza melanocorys* Stejneger—Lark Bunting.
This bird was common along the road from Ogallala to Grant, June 22, 1905, and Zimmer saw numbers of them between Grant and Imperial, July 1, 1911. The birds are present throughout the hills and undoubtedly breed there, though no nests were discovered. They are often seen along the road, usually in pairs, a black and white male with its duller colored and streaked mate, where they precede one along a line of fence, flying ahead from post to post or from wire to wire and finally swinging around in a wide circle and returning to a position some distance behind. At Haigler, Swenk flushed a lone bird west of town July 24, 1903, and the next day started several pairs of them from a large deep blowout in the sandhills north of that town. Zimmer did not note the Lark Bunting at Haigler.

42. *Progne subis* (Linnaeus)—Purple Martin.
Swenk noted this swallow at Imperial, June 23, 1905, and at Haigler two days later. Zimmer did not find the species at Haigler in 1911.

43. *Petrochelidon lunifrons* (Say)—Cliff Swallow.
On July 24, 1903, Swenk saw five of these swallows flying over the river at Haigler, and on June 26, 1905, others were again noted at the same locality, but the species was not seen by Zimmer in 1911.

44. *Hirundo erythrogastra* Boddaert—Barn Swallow.
One was seen between Ogallala and Grant, June 22, 1905, by Swenk, and a dozen or more pairs were found nesting under a bridge at Haigler four days later by the same observer, who noted three birds at Benkelman on the 23rd, also, Zimmer found Barn Swallows common at Haigler, noting individuals on July 4, 6, and 11, 1911.

45. *Riparia riparia* (Linnaeus)—Bank Swallow.
Swenk noted twenty-six of these swallows between Benkelman and Parks, July 23, 1903, and Zimmer saw several of them at Haigler on July 4 and again on July 8, 1911.

46. *Stelgidopteryx serripennis* (Audubon)—Rough-winged Swallow.
Zimmer noted this species at Haigler on July 5, 8, and 11, 1911, where it was somewhat more common than the Bank Swallow.

47. *Lanius ludovicianus excubitorides* Swainson—White-rumped Shrike.

On July 11, 1911, Zimmer saw several of these shrikes near Haigler.

48. *Vireosylva gilva* (Vieillot)—Warbling Vireo.

Zimmer heard a warbling vireo singing in the top of a tall tree in the Arickaree valley on July 6, 1911, but an attempt to collect the bird was unsuccessful. No others of this species were noted. It is possible that the warbling vireo of extreme southwestern Nebraska may be the western form, *V. g. swainsoni*, which occurs in Sioux county and over Colorado, but the taking of specimens must determine this point.

49. *Geothlypis trichas occidentalis* Brewster — Western Yellow-throat.

A single bird seen July 11, 1911, near Buffalo creek east of Haigler should probably be referred to the western subspecies, which is the breeding form in Colorado and in northwestern Nebraska. The bird was noted by Zimmer, but was not secured as it retreated to a dense brush heap from which it could not be dislodged.

50. *Mimus polyglottos leucopterus* (Vigors)—Western Mocking-bird.

Zimmer noted this bird twice at Haigler, on July 8 and 11, and collected a pair on the first mentioned date. They were found in a little grove along the river.

51. *Toxostoma rufum* (Linnaeus)—Brown Thrasher.

Zimmer saw a single Brown Thrasher several miles west of Haigler on July 6, 1911. It was in a thorn hedge and probably nested somewhere in the vicinity.

52. *Penthestes atricapillus septentrionalis* (Harris)—Long-tailed Chickadee.

A single bird noted by Swenk along the river near Haigler, flying by and calling, July 24, 1903.

53. *Sialia sialis* (Linnaeus)—Bluebird.

Heard by Zimmer on the morning of July 4 about 3:40 A. M., before the local celebration started at Haigler, but not found again until July 9. Among only a single pair near this town and not observed elsewhere in the region by either Zimmer or Swenk.

SEVERAL INTERESTING WARBLER RECORDS FROM DAWES COUNTY.

Black-throated Green Warbler—(*Dendroica virens*)—On September 14, 1911, I took a fine male of this pretty warbler in Squaw canyon, near Crawford. The bird was noted first in a brush heap along the creek but flew to the low branch of an overhanging willow, from which place I secured it. The species is usually restricted to the more eastern parts of the state.

Townsend Warbler— (*Dendroica townsendi*)—On September 19, 1911, I was exploring the shrubbery along West Ash creek, north of Squaw Mound, when I noticed a warbler which was new to me. It was extremely shy and hard to approach and I completely lost sight of it for a time, but I finally secured it and found it to be an adult male Townsend Warbler. This is the first record of the occurrence of this western warbler in Nebraska.

MacGillivray Warbler—(*Oporornis tolmici*)—A single adult male of this species was found and secured in West Ash creek canyon on September 11, 1911. This individual was moving rapidly about the willows that margined the creek at this place and was so active that I had difficulty in getting a fair shot at it. Cary found this warbler as a probable breeder in Monroe canyon and in the bad-lands pockets of Sioux county in the summers of 1900 and 1901.

Pileolated Warbler (*Wilsonia pusilla pileolata*)—I found the Pileolated Warbler to be one of the commonest birds and by far the commonest of the Mniotiltidae in the canyons during the fall migration in 1911. Usually they were to be seen in the little clumps of dogwood and willow that line the creek banks and roadsides, but on September 17 I saw a single bird at the extreme summit of the ridge among the pines where it was associating with a flock of Audubon Warblers. The little "chib" of the Pileolated was quite characteristic, and was alone enough to distinguish the little fellows from their neighbors in the canyons. The birds were quite fearless and full of curiosity and I was able to take a number of specimens, all of which are distinctly referable to this western form.

J. T. Zimmer, *Lincoln*

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BIRDS OF THE THOMAS COUNTY FOREST RESERVE

BY JOHN T. ZIMMER

This paper is intended to treat of the birds found on the United States Government Forest Reserve, which lies chiefly in Thomas county, Nebraska, with headquarters at Halsey. The period of observation extends from April to latter October, and thus includes not only all of the breeding birds and summer residents, but the spring and fall migrants as well, while the latter probably further include most of the wintering forms.

The first ornithologists to visit the Reserve were L. Bruner and R. H. Wolcott, who were there in May, 1904, and again in April, 1905, being on the latter trip accompanied by H. B. Ward. In 1906, Frank M. Chapman, accompanied by an artist and a preparator, Messrs. Bruce Horsfall and J. D. Figgins, and by L. Bruner, made a flying trip to Halsey for the purpose of getting material for the Prairie Chicken group of the "habitat groups" at the American Museum of Natural History. His party was present at the Reserve from May 3 to 6 of that year, and his notes published in his "Camps and Cruises of an Ornithologist" contain references to certain birds not recorded by the other observers. In June of the same year R. H. Wolcott visited the Reserve and made observations, and in July, 1908, he returned there, accompanied by F. H. Shoemaker, and made further notes on the birds of the region. In July, 1909, (10-12) M. H. Swenk, accompanied by J. A. G. Rehn of the Philadelphia Academy of Natural Sciences, visited the Reserve and made notes on the breeding birds, while the following year, from October 27-29, he listed the fall migrants. My first trip to Halsey was a flying one made in June, 1911, from the 7th to

the 10th of that month, when I was accompanied by M. H. Swenk. In July of that year a party, headed by R. H. Wolcott and F. H. Shoemaker, spent part of that month on the Reserve studying the fauna, while I returned to the region on August 20 following, and was present until September 3, at which time I left the Reserve for more western portions of the state. Returning on September 20, I was again at the Reserve until the 24th of that month, which date closed my observations there for the year. The following year, 1912, I reached Halsey on the evening of May 14 and left on September 10, having spent all of the time between these dates on the Reserve, with the exception of a week from June 28 to July 5.

My personal notes and observations were made during spare time from an entomological problem which was the immediate cause of my presence at the Reserve, most of them in the valley of the Middle Loup river, that being the stream which flows immediately past the Reserve station. Several trips were made, however, on horseback across the hills to the Dismal river, which, directly south of the station, lies about eight or nine miles away and which presents some features differing from those on the Middle Loup, such as a more meandering course in a narrower valley with heavier and larger timber and a more plentiful sprinkling of native cedars. These trips were made on May 26, June 16 and July 14, 1912. The following list and observations are based primarily upon data from my own note-books, but I have drawn upon the notes of the other observers, which have been placed at my disposal, wherever they have added forms or observations which were not noted by me. The record as presented may be considered as covering a period from May 3 to October 29 with practical completeness.

Perhaps a short description of the various types of country found on the Reserve will aid in a better understanding of some of the notes made in this paper. Briefly stated, two faunal regions occur on the Reserve, Sandhill and Prairie, the former Upper Sonoran and the latter Carolinian. The Sandhill type of country is the predominant one and occupies all of the territory with the exception of the river valleys which are more of the Prairie type, and which exist as narrow tongues extending well into the sandhills. Both regions contain various types of habitats which are more or less distinct in certain respects, although it is not always possible to delimit them solely by the nature of their bird population. These habitats

have been classified by R. H. Wolcott in his "Analysis of Nebraska's Bird Fauna" (*auct* IV, part 2, p. 48, 1909) but the conditions on the Reserve present a slight variation due to the proximity of the two faunal areas and the presence of a considerable number of planted pines. The habitats may be defined as follows:

A.—SANDHILLS (UPPER SONORAN).

1. *Open country.*

a. GRASSLAND.—The greatest portion of the area embraced by this paper is of this type. It is a succession of hills and hollows, the latter of varying size and depth, very frequently much elongate or more or less connected with other hollows in almost continuous succession for some distance, with the closed valleys thus formed separated from corresponding valleys to the northward or southward by similarly extending ranges of hills. In general, however, the conformation is irregular. No running water occupies the region. The soil is sand with a characteristic vegetation of Bunch-grass (*Andropogon scoparius*), yucca, cacti of several species and other plants. The birds which breed in this area are the Upland Plover, Prairie Chicken, Prairie Sharp-tailed Grouse, Burrowing Owl, Mourning Dove, Desert Horned Lark, Western Meadowlark, Western Vesper Sparrow, Western Grasshopper Sparrow and Western Lark Sparrow. Five of these ten were not found breeding elsewhere—the Prairie Chicken, Prairie Sharp-tailed Grouse, Mourning Dove, Western Vesper Sparrow and Western Grasshopper Sparrow; the rest were noted in the river valley either breeding or in situations which gave strong probability of their doing so.

b. SANDY WASTES.—Most of these are blowouts or sand pits scooped out of the hills, usually on the southwestern slope. The point ornithologically interesting is the fact that the rotary action of the wind in forming these blowouts has cut the sand from one side, perhaps more commonly the southwestern one, and left it more or less sheer and hard-packed in contrast to the opposite slope of loose sand. This firm bank is used by the Belted Kingfisher and Rough-winged Swallow to hold their horizontal burrows when no suitable places are available along the river

shore. When the latter situations are available, however, the birds by preference make use of them. Other sandy wastes, artificial in their primal origin but presenting no features not already shown by natural formations, are the plowed fire-guards. These the wind frequently seizes upon and converts in part into blowouts—the remainder are mere strips of bare sand like the numerous denuded areas on the hills which have been hollowed out hardly enough to be called true blowouts. These places are frequented by the Sennett Nighthawk, which bird is characteristic of the habitat, rarely if at all breeding in the valley although commonly seen there in its crepuscular flights.

2. *Shrubbery.*—Shrubbery of various kinds dots the hills in places, but in many of the deeper hollows where the snow drifts pile up in winter in the shelter of the northwest wall and there furnish a greater supply of moisture than elsewhere in the spring, the result has been to produce a heavier growth of vegetation in that particular portion of the valley. The plants which ordinarily form these pockets are several. The low-growing New Jersey Tea *(Ceanothus americanus)*, Wolfberry *(Symphoricarpos occidentalis)* and Wild Rose *(Rosa arkansana)* occur in beds which shelter the Western Field Sparrow. Wild Plum *(Prunus americana)* and Western Choke Cherry *(P. melanocarpa)* often form dense thickets which are utilized by the Western Blue Grosbeaks. Hackberry *(Celtis occidentalis)* and Ash *(Fraxinus lanceolata)* are of frequent occurrence, sometimes in such quantity as to warrant the application of the name grove. The Hackberry furnishes nesting sites for the Swainson Hawk and Great Blue Heron and probably also the Arkansas Kingbird. The only Marsh Hawk nest discovered was in the shelter of one of the beds of *Symphoricarpos,* but it is probable that a heavy growth of tall grass would have answered the purpose just as well.

3. *Wet places.*—No permanently moist valleys or sloughs are present among the hills near the Reserve and hence no notes were made concerning the bird population of such places. Moist spots in the neighborhood of stock windmills exert an influence, at least on the insect life of the place but they are of such small size as to have little effect

on the bird population. However, the Killdeer has been found nesting in such a situation. Certain of the valleys undoubtedly contain enough moisture in the early spring to affect the migrating visitors but during the nesting season they are usually dry and cannot be considered under the present heading.

4. *Lakes*— Although present in many parts of the sandhills, lakes are absent in the territory embraced by this paper.

5. *Ranch buildings.*— The artificial conditions imposed by ranch buildings probably affect bird life in the hills as well as in the valleys, but in the absence of any such building in the portion of the hills which I explored, I am unable to give any data on this particular habitat.

6. *Planted groves.*— Pine groves are not a natural habitat of sandhill country nor yet an ordinary artificial one, but the presence of a pine-covered area so large as that on the Reserve will, someday, in all probability, furnish conditions not to be disregarded in a consideration of the biology of the region. Even now there is an appreciable effect on the entomology of the place, but the trees are mostly of such small size and of so recent establishment that as yet little influence is to be noted on the bird life of the region during the breeding season. It is hardly possible that the occurrence of the Audubon Warbler and Rocky Mountain Bluebird, both residents of pine-covered territory, can be attributed to the presence of the conifers on the Reserve, especially since neither bird was seen in the planted areas.

   No groves of deciduous trees were found which were of undoubted artificial origin. One or two were visited which might have been planted but they presented no features which distinguished them, ornithologically speaking, from some of the larger natural groves. One nest, evidently that of a Swainson Hawk, although not definitely so determined, occupied a tree in one of these places. No other possibilities in the nature of breeding birds were noted.

B.—PRAIRIE (CAROLINIAN).

1. *Larger streams with sandy mud flats and sandbars.*— This habitat is furnished by the Middle Loup and Dismal rivers,

both of moderate size and with sandy beds. As breeding inhabitants the Killdeer and Spotted Sandpiper were to be noted definitely, and the latter bird was found breeding nowhere else.

2. *Smaller streams with steep, muddy banks.*—The Dismal river should probably be partially classified in this group, since in its meanderings it cuts numerous cliffs in the hills that margin its course. These banks are steep and often clayey and are occupied by the Belted Kingfisher and the Rough-winged and Bank Swallows, birds, the first two of which at least, in the absence of such situations resort to blowouts in the sandhills for nesting.

3. *Prairie ponds.*—This habitat occurs along the river at various points but seems to be lacking near the locality of my observations. The grassy banks of a tiny brook or two sheltered a few Redwinged Blackbird nests but the area embraced was too limited to furnish very ample data on such environment.

4. *Thickets along the river.*— Thickets occur at various points along the rivers and consist mostly of growths of Wild Plum, Western Choke Cherry, Dogwood *(Cornus stolonifera),* Haw *(Crataegus occidentalis)* and Sandbar Willow *(Salix fluviatilis)* interlaced with a tangle of Wild Raspberry *(Rubus occidentalis),* in places so dense as to be almost impenetrable, and, at least in summer, very hot and close. Here are found the Screech Owl, Yellow-billed and Black-billed Cuckoos, Kingbird, Blue Jay, Redwinged Blackbird, Orchard Oriole, Pale Goldfinch, Western Field Sparrow, Black-headed Grosbeak, Bell Vireo, Yellow Warbler, Maryland Yellowthroat, Long-tailed Chat, Catbird and Brown Thrasher. Of these, the Kingbird, Bell Vireo, Maryland Yellowthroat, Yellow Warbler and Catbird were found to breed nowhere else. This environment, of all those present on the Reserve, is the richest in species and total inhabitants, for its extent, both during the breeding season and during migration; more than one-half of the birds included in the following list were found in these thickets at one time or another.

5. *Thickets back from the streams.*— These differ from the foregoing mostly in their position at or near the base of the hills which gives them a partial resemblance to the

hill pockets. Willows *(Salix humilis)* are less frequent here than in the river thickets, Ash *(Fraxinus lanceolata)* occurs commonly, and the growths of *Symphoricarpos* and other low shrubs add their quota to the list of residents. As these thickets are intermediate between the sandhill and river growths, they possess something of the character of both and have little that is truly characteristic. The regular residents are the Screech Owl, Yellow-billed and Black-billed Cuckoos, Blue Jay, Pale Goldfinch and Long-tailed Chat in common with the riverside habitat, Western Blue Grosbeak in common with the sandhill pockets, Western Field Sparrow in common with both, and the Arctic Towhee and Black-and-White Warbler more plentiful here than elsewhere if not entirely confined to this environment.

A possible subhead under the above might be entitled *Woodland.* At various places the trees are large and the ground beneath is cool and shaded. Mossy springs may be present although the water does not flow far before it gradually seeps into the sand. Such situations may tempt the more arboricole birds during migrations, for it was there that I noted the Robin and Audubon Warbler, there the Olive-backed and Willow Thrushes were the most abundant, and there the Redstart and Black-poll Warbler were seen the most frequently. So far as I could learn, however, there were no characteristic breeders in this particular territory.

6. *Open Country.*

a. GRASSLAND.—The grass-covered portions of the valley support but one species distinct from those of the open sandhills—the Dickcissel. Other breeders in the habitat are the Upland Plover, Burrowing Owl, Desert Horned Lark and Western Lark Sparrow. The Western Meadowlark and Western Grasshopper Sparrow may also breed there but good evidence is lacking.

b. SANDY STRETCHES.—These patches of bare sand occur frequently in the region where the wind has persistently blown away the loose soil and prevented vegetation from taking hold. Plowed fields often form a base for such operations. The Sennett Nighthawk (rarely), Killdeer and Desert Horned Lark (more frequently) are seen there

but I never found evidence of the breeding of these birds in such places.

7. *Ranch buildings.*—Two birds alone seem to have utilized man-made stuctures in their nest building—the Barn Swallow and the Western Lark Sparrow—the latter but once to my knowledge as described under the discussion of that species. The swallow is probably dependent on man for its presence in the region but the sparrow is able to find and does find nesting sites of various sorts over most of the region and is not dependent on human aid.

8. *Planted groves.*—No data are at hand to indicate the effect of artificial groves on the species of birds occurring in the locality. Only in their artificial nature do such groves differ from some of the *woodland* or some of the natural groves of trees in the valley, and the very presence of the latter would tend to minimize the effectiveness of the former in their influence on bird life were such influence present. As stated in the note on *woodland*, such effects are not noticeable and at present I am unable to offer any discussion of this particular habitat.

In examining the above notes it must, of course, be borne in mind that the divisions do not hold during migrations, at which times the birds wander over a wide range of territory. Witness the occurrence of the Kingbird, Black-headed Grosbeak and Brown Thrasher miles from the river valley in a hackberry grove. Even during breeding time, some of the species frequent situations where they do not nest, for example the Mourning Dove, Sennett Nighthawk and Great Blue Heron.

Owing to the merging of the Prairie and Sandhill regions on the Reserve, some difficulty is experienced in assigning the proper region to certain of the species of birds, especially in the case of the migrants which because of the proximity of the two faunal areas, may be found in both of them within the space of a very few minutes. In the case of the breeders it is not so difficult and some interesting comparisons may be brought out by tabulating the forms somewhat as follows:

1. Birds common to both Sandhills and Prairie in the state which preferred Prairie when both regions were avail-

able:—

Killdeer	Western Lark Sparrow
Bobwhite	Arctic Towhee
Screech Owl	Dickcissel
Burrowing Owl	Bank Swallow
Black-billed Cuckoo	Rough-winged Swallow
Belted Kingfisher	Yellow Warbler
Northern Flicker	Catbird
Kingbird	Brown Thrasher
Traill Flycatcher	

2. Birds common to Sandhills and Prairie, which preferred Sandhills:—

Great Blue Heron	Arkansas Kingbird
Prairie Chicken	Desert Horned Lark
Prairie Sharp-tailed Grouse	Western Meadowlark (near Prairie)
Mourning Dove	Western Vesper Sparrow
Marsh Hawk	Western Grasshopper Sparrow
Swainson Hawk	Western Blue Grosbeak
Sennett Nighthawk	Lark Bunting

3. Birds common to Sandhills and Prairie, of equal distribution over both:——

Upland Plover	Western Field Sparrow

4. Birds restricted in their choice because of the absence of their accustomed habitat in the Sandhills. All of them common to both regions in general but here restricted to Prairie:

Spotted Sandpiper	Barn Swallow
Redwinged Blackbird	

5. The remainder are Prairie forms which keep to Prairie habitats:

Yellow-billed Cuckoo	Bell Vireo
Blue Jay	Black-and-White Warbler
Orchard Oriole	Maryland Yellowthroat
Pale Goldfinch	Long-tailed Chat
Chipping Sparrow	

(Note:—The absence of typical Sandhills birds is due to the

absence of lakes and marshes, since most of these are shore and water birds).

There is little to add here to this discussion. In general it appears that the brush and thicket inhabiting birds prefer such places in the valley and that the open country birds are better suited in the hills. This is not entirely due to the greater abundance of the accustomed habitat in the preferred region because many of the thickets in the hills are fully as dense and secluded as those in the valleys, and, on the other hand, there is much open country in the valleys. Undoubtedly a detailed study of the various habitats in the regions throughout the state will bring to light much that will aid in explaining these facts but such a detailed study I will leave for other and later treatment and will allow the following list to stand as it is.

1. *Larus delawarensis* Ord—Ring-billed Gull.

On August 28, 1911, I saw a single gull of this species winging its way along the Loup river, and on May 21, the following year, I saw another bird in much the same situation. The species is probably only a migrant in this vicinity although it remains throughout the summer in the lake region of Cherry county, adjoining Thomas county on the north.

2. *Larus franklini* Richardson—Franklin Gull.

R. H. Wolcott reports this gull migrating at Halsey. I have never noted the species there nor have I other records of its occurrence there.

3. *Sterna forsteri* Nuttall—Forster Tern. This bird is also a migrant, being reported by R. H. Wolcott alone.

4. *Hydrochelidon nigra surinamensis* (Gmelin)—Black Tern.

The Black Tern may breed in suitable situations in the region under consideration but I did not succeed in finding any indications of the fact, although there were birds present in small numbers up until June 10. None were seen after that date until July 31, from which time they were again noted until August 9. The species breeds quite commonly in Cherry county and other favorable localities over the state, including parts of the sandhills, and might very well breed on the Reserve also in the presence of reedy ponds and marshes such as occur elsewhere alongthe Loup river. If any such marshes are

near the Reserve I failed to find them, which may, in part at least, account for the absence of positive breeding records. The terns were usually found along the river, darting through the air in graceful, swallow-like flight or moving quietly over the stream with eyes intent on the water, ready at an instant's notice for a lightning-like descent upon some luckless fish. When not thus engaged they could be seen standing singly or in a row along the edge of a sandbar, heading into the wind and motionless except when now and then one would busy itself with preening its feathers.

5. *Pelecanus erythrorhynchos* Gmelin.—White Pelican.
This pelican was noted by R. H. Wolcott at Halsey. No other records are at hand.

6. *Mergus americanus* Cassin—Merganser.
On May 21, 1912, I saw five Mergansers on the Middle Loup and watched them for some time as they swam about in the stream. Finally, one by one, they emerged on to a low sandbar near the far shore of the river, and, burying their heads in their back feathers, they settled down for a peaceful nap from which they were soon rudely awakened by something which must have alarmed them for with one accord they straightened their necks, leaped into the air and sped away up stream. This date is a rather late one for the occurrence of this duck in Nebraska as it is one of the earlier migrants to pass through the state on the way to its breeding grounds.

7. *Anas platyrhynchos* Linnaeus—Mallard.
The Mallard was found only during migration although it breeds commonly in localities throughout the state. I saw a flock of these ducks on June 10, 1911, and another on August 25, 1912, both on the river near the Reserve. M. H. Swenk noted a flock of twenty-five on the Loup October 28, 1910, and a smaller flock on the following day. Although but a migrant the species is undoubtedly of regular occurrence.

8. *Chaulelasmus streperus* (Linnaeus)—Gadwall.
Two ducks of the present species were noted on the Middle Loup river on June 14, 1912, two on June 19 on the same stream but several miles farther up, and a single bird on June 24 near the place where the last two were

seen. These birds, probably only a single pair seen on the several occasions, very likely bred in the valley but I found no nests to corroborate this conclusion. This duck is known to breed locally in the sandhills.

9. *Nettion carolinense* (Gmelin)—Green-winged Teal.
A flock of about a dozen were noted on the Loup, August 28, 1910, by M. H. Swenk.

10. *Querquedula discors* (Linnaeus)—Blue-winged Teal.
The Blue-winged Teal also nests in the sandhills of Nebraska and had I been near any lakes or ponds I would probably have found breeding pairs of the birds, but the only occasions I saw the species were August 30, 1911, and May 17, 1912, a solitary bird in both cases, the first one on the river, the second on a little brook emptying into the larger stream. M. H. Swenk flushed several from ponds and sloughs near Dunning, June 7, 1911, and R. H. Wolcott noted it in June, 1906.

11. *Spatula clypeata* (Linnaeus)—Shoveller.
This duck is recorded by R. H. Wolcott as occuring during June, 1906, and doubtfully in July, 1911. It is probably only a migrant at this point.

12. *Dafila acuta* (Linnaeus)—Pintail.
Pintails are recorded by F. M. Chapman as having been seen on the river at the Reserve. The species did not occur during my observations, which, however, took place some time after the normal migration period of these ducks.

13. *Marila affinis* (Eyton)—Lesser Bluebill.
A pair of Lesser Bluebills was seen on the Dismal river on May 26, 1912, but neither of the birds was noted on any of the later excursions to that stream. Although evidently mated, these were in all likelihood only migrating individuals. A small flock was noted on the Loup by M. H. Swenk October 28, 1910.

14. *Botaurus lentiginosus* (Montagu)—Bittern.
The only time I saw the Bittern was on August 20, 1911, on which date I flushed a single bird from the margin of the river where it had been half concealed in the tall grass. R. H. Wolcott records it in June, 1906, and July, 1908, and F. M. Chapman in May, 1906.

15. *Ardea herodias* Linnaeus—Great Blue Heron.

During June, 1911, and throughout the summer of 1912, I saw Great Blue Herons on the Middle Loup, and on several trips to the Dismal river in the latter year also found the birds, wading solemnly over the sandbars and through the shallows or standing motionless—slim gray shadows, hardly to be noticed until some movement betrayed their presence. At dusk they often showed black against the sun on the water or loomed up big as they flew overhead, now and then uttering a harsh, discordant squawk. Not infrequently I would hear them down on the river in the middle of the night, when their voices, not the most musical at any time, would assume an added weirdness. Once in the spring I saw a small group of the herons in the valley back from the river but they seemed to have no particular business to perform there and flew abruptly on being approached, only to alight on the nearest hillside. At times, too, they would alight on the hill tops near the Reserve station and stand motionless or stalk gravely along the summit. On the evening of May 21, 1912, a flock numbering thirty or forty flew overhead, going eastward, but these were, I suspect, the members of a nesting colony.

Such a colony I knew to be located somewhere back in the hills but although I learned of the general location of the place from different persons who had been there, no one seemed able to furnish me with accurate directions for reaching the place. On May 19, 1912, I set out with several of the forestry men in an attempt to find the pocket in which grew the little grove of trees where the herons had chosen to build their nests. After most of a day spent in quartering the ground for miles in every direction from a point which we had chosen as a center of operations, we had almost made up our minds to give up the search or try in some other direction when a heron was noted overhead, apparently returning from a fishing trip on the Dismal. We followed it with our eyes and saw it alight scarcely a half mile away in what appeared to be a patch of low growing bushes in a shallow depression. When the place was reached the shallow depression was found to be a deep but not extensive valley, and the low bushes the tops of hackberry trees twenty or thirty feet in height. The trees formed a circular grove seventy-five or a

hundred feet in diameter, which, viewed from a little distance, presented the appearance of a huge nest, since it was depressed in the center where the trees were smaller and more bent, weighted down, evidently, by the heron nests which were more numerous there than at the outer edge. This appearance of the grove, however, was much more apparent later in the summer after the leaves were well out on the trees, but at this time, all the more clearly because of the comparatively bare branches, the trees and the ground beneath showed white with the droppings of the generations of the birds which had been reared there.

At our approach thirty-two herons rose into the air and circled around with loud outcries, but finally they alighted on the crests of the nearby hills where they stood on every side lined up like sentinels on post. Occasionally one or two would sail over the grove to reconnoiter, only to fly back to resume their old posts or occupy new ones. We found the nests to be bulky constructions of sticks, hardly more than hollowed-out platforms, a yard or so in diameter and with the depression about six inches deep. From the hill above I had seen the pale greenish-blue eggs in the nests but under the trees I found broken eggshells, so I suspected the presence of young birds also. Later I discovered a few young herons, although most of the eggs were as yet unhatched. The usual number in a clutch was four, but some sets were of five.

On May 30, I returned to the heronry, and although at this time one set of eggs was discovered, all the others had hatched and the nests contained young birds in nestling down of white. These little fellows put up a comical fight when disturbed, craning their long necks and striking out bravely with their sharp bills, which might have been formidable enough had they managed to reach one's eyes. On June 24 another trip to the heronry found the young birds well feathered and clambering over the nests, frequently passing from one tree to another during their scramblings. On this occasion the odor of dead fish was unpleasantly strong, although it had not been particularly noticeable on the previous visits. Several dead fish, measuring up to a foot in length, were found under the trees.

I did not get back to the place until the 25th of August

and by that time it was almost deserted. Only three birds were seen about the grove and these appeared to be on the eve of departure. In fact, no herons had been seen along the river for some time previously. August 31 I saw the last one, perhaps one of those seen at the heronry on the 25th, a lone bird, fishing along the river.

This heronry is situated between the Dismal and the Loup rivers, about nine miles from the former and four miles from the latter. Both streams are visited by the birds. Another heronry is said to be located a number of miles west of the one I visited but I never found time to search for it.

16. *Butorides virescens* (Linnaeus)—Green Heron.

No Green Herons were in evidence during 1912, but on August 28, 1911, a single male bird was taken from its perch on a brush heap overhanging the river. This furnishes a rather westerly record for the species in Nebraska.

17. *Nycticorax nycticorax naevius* (Boddaert)—Black-crowned Night Heron.

The Black-crowned Night Heron is probably only a migrant at Halsey although it breeds locally in the sandhills of the state. Two records are in my note-book, one of an immature bird noted standing in the shallows of the river on September 20, 1911, the other of a lone individual seen flying along the stream on September 3, 1912.

18. *Grus mexicana* (Muller)—Sandhill Crane.

The Sandhill Crane has been noted by R. H. Wolcott as occurring in the region.

19. *Fulica americana* Gmelin—Coot.

The Coot is a summer resident and possible breeder in the lakes and marshes of the sandhills but I noted it only once at Halsey. July 17, 1912, one was seen swimming about alone in the river near the Reserve station.

20. *Gallinago delicata* (Ord)—Wilson Snipe.

F. M. Chapman reports a Wilson Snipe from the Loup valley but I saw none there, although on May 26, 1912, I flushed one from a boggy flat along the shore of the Dismal river where it had been poking about in the spring-dotted soil. It did not flush until very nearly trod

upon by my horse. It was not seen on later occasions and was, in all likelihood, a migrating bird.

21. *Pisobia maculata* (Vieillot)—Pectoral Sandpiper.
Reported by R. H. Wolcott as present in June 1906.

22. *Pisobia fuscicollis* (Vieillot)—White-rumped Sandpiper.
This sandpiper was noted on August 21, 1911, and again rather commonly from May 20 to 31, 1912, on both the Loup and Dismal rivers. A flock of twenty-five White-rumped and Baird Sandpipers was seen at the latter place on May 26, while single individuals of the present species were noted in the Loup valley as late as June 5 and June 19.

23. *Pisobia bairdi* (Coues)—Baird Sandpiper.
I saw a Baird Sandpiper on August 21, 1911, and during 1912 I found flocks of the birds on the Loup river on May 21, 31 and June 1. On May 26 they were seen on the Dismal river in company with the preceding species.

24. *Pisobia minutilla* (Vieillot)—Least Sandpiper.
On July 12, 1912, I saw a pair of Least Sandpipers in a very favorable situation for their breeding. They were at the time out in the middle of the stream on a sandbar and were quite wary. Since I could not conceal myself while approaching them, I was unable to get within range before they became sufficiently alarmed to fly. These birds were not migrants, I believe, although they may have been merely summer residents.

25. *Ereunetes pusillus* (Linnaeus)—Semipalmated Sandpiper.
The Semipalmated Sandpiper was noted very sparingly on August 20, 1911, and on May 21 and 25, 1912, on the Middle Loup and was seen in small numbers on the Dismal river on May 26 of the latter year. It probably migrates regularly at Halsey in greater or less numbers.

26. *Totanus melanoleucus* (Gmelin)—Greater Yellow-legs.
On September 20, 1911, there was a single Greater Yellow-legs present on the sandbars in the river near the station. It was not noted on other occasions.

27. *Helodromas solitarius* (Wilson)—Solitary Sandpiper.
I noted the Solitary Sandpiper on September 1 and 2, 1911, and on July 12 and 17 and September 6, 1912, a

single bird in every instance. An adult female taken July 12 showed no ovarian development such as would have been present had she been a breeding individual. At most the species can be considered as a summer resident at this locality.

28. *Bartramia longicauda* (Bechstein)—Upland Plover.

From May 17 until August, 1912, I found Upland Plovers at various times in both the Loup and Dismal river valleys as well as scattered over the intervening hills. They were not abundant as I found them to be at Imperial in Chase county (*antea* V, p. 41, 1912) but the surroundings are as favorable for the birds as at that locality and with the dimunition of their breeding grounds by the settlement of the land in other places they will in all probability retire to just such situations as this country affords. The region is suitable for little but grazing in its present state, and it will not for a long time, if ever, be anything but the endless succession of grass-covered hills and hollows, broken here and there by blowouts and patches of bare sand or by a tiny clump of shrubbery in a pocket—just the sort of territory where these retiring birds thrive best. These plover-like sandpipers are often seen stalking through the grass like the Bobwhite, and when alarmed fly with rapid wing beats and a clear, whistled, "whoet'-whoet'-whoet'- whoet' — —." If a fence post be near they may alight upon it or they may circle around in a wide sweep and alight upon the ground but a short distance away. The most characteristic note of the birds is almost indescribable but it may perhaps be represented as a long, rolling, "pr-r-r-r-r-r-re-e-e-e-e-e-o-u-u-u-u——," the syllables blending into one another in a rising inflection until the climax is reached and then dying away into silence. When heard on a still night from the darkness overhead, the sound is almost uncanny, and even in daylight there is something in the nature of it which seems quite in keeping with the lonely surroundings of these birds.

29. *Tryngites subruficollis* (Vieillot) — Buff-breasted Sandpiper.

A single Buff-breasted Sandpiper was found on the shore of a little sandbar island in the Loup river on September 2, 1911, but was too wary to allow itself to be taken. I

have no other records of the occurrence of this bird at Halsey. It is not common anywhere in the state.

30. *Actitis macularia* (Linnaeus)—Spotted Sandpiper.

Spotted Sandpipers were scattered along the Middle Loup and Dismal rivers and were noted until September 7, 1912. One pair was seen frequently on a little wooded island near the Reserve station but, although I felt sure that there was a nest at this place, I was unable to find it until June 13. On that date I set out to make a minute survey with the resolve to find the nest if at all possible. I waded out to the island and sat down near the center of it to see if the birds would give me any clue, for in that part of the island they had been seen on many occasions and it was there, in fact, that the female was always last seen when I suspected that she was returning home. Scarcely had I seated myself when the male was overhead, nervous and fluttering. He circled about me once or twice and then flew over a nearby clump of willows, so I rose to my feet and circled the group of trees, entering it at the opposite side. The center of the place was somewhat more open than the margin and barely had I set foot within the clearing when the female was up before me. It took no exertion on my part to find the place from which she had flown and the nest was soon in view, if nest it could properly be called. It was a mere hollow in the ground at the foot of a willow stub and was lined only by the rubbish of sticks and leaves which covered the earth at that place, and contained four eggs. A young male of the species was secured on August 20, 1911, evidently a bird reared in the neighborhood, possibly by the same pair whose nest I found the following year.

31. *Numenius americanus* Bechstein—Long-billed Curlew.

On July 11, 1912, Mr. Bovee, a ranchman living near the Reserve station, told me that he had seen a family of Long-billed Curlews, old and young, in the river valley near his place only the day before. I attempted to find them on the following day but was unsuccessful in catching sight of them, although that evening I heard the call of one overhead when it was too dark to see the bird itself. This one was flying in the direction of Mr. Bovee's place and may well have been one of the birds he saw.

32. *Oxyechus vociferus* (Linnaeus—Killdeer.

The Killdeer was undoubtedly the commonest of the shore birds present at Halsey and was found until the 3rd of September in 1911, and until the 5th of that month in 1912. It may have been present in 1911 later than the 3rd, which was the last date of my observation until the 20th, but it was absent in the latter part of the month when I returned to Halsey. Two nests of four eggs each were found on the same island as the nest of the Spotted Sandpiper and in a very similar situation, although in a different clump of willows. The parent Killdeers were never seen on the nests and never tried to lead me away from their vicinity by the methods which some birds employ of feigning a broken wing, but when I was near the group of willows the birds would squat down in a depression of the sand nearby and remain perfectly quiet, only now and then raising their heads to see if I had gone. So long as I remained motionless, so did they, and by no means could I make them acknowledge ownership of the nests or eggs except by their nervous attitude and the fact that they were more quiet than usual. The ordinary notes of the Killdeer are the well known, "kill-dee kill-dee kill-dee----," and the "cry-baby-baby-baby-baby-cry-baby-baby." One bird, which I heard a number of times several miles up the river from the station, possessed some peculiarity in its voice so that the "baby" part of the latter call was given in a falsetto key. The result was ludicrous, as can be imagined.

33. *Colinus virginianus* (Linnaeus)—Bob-white.

In 1911 about a dozen of these birds were present on the Reserve near the station where I saw them nearly every day, but during 1912 I found them only at intervals and then so few, only one or two at a time, that I suspected that the numbers had decreased materially. The explanation was found when I was told that Bob-whites had been found frozen several times during the winter of 1911-1912. Most of the birds were in the brush along the river, but often I found them in the open valley and in the undergrowth at the base of the hills. On August 28, 1911, a single Bob-white was seen about a half-mile back in the hills, and on June 7, 1912, one was heard but not seen in almost the same situation.

34. *Tympanuchus americanus* (Reichenbach)—Prairie Chicken.

Although I saw but a single Prairie Chicken during 1911, I found the birds in numbers during 1912, when, in the earlier part of May, the loud booming of the males could be heard in the early morning from different points in the surrounding prairie. A few weeks later flocks of downy young were found, ranging the hills in charge of their watchful mother. Several times I came across the young birds when my first indication that they were near at hand was the sight of the parent skulking through the grass or fluttering over the hill, apparently badly hurt. In such cases I refused to be deluded and began to search for the little striped fellows hidden in the grass, often with the result of finding them almost under my feet. There was no movement on their part to tell me they were there nor did they do anything but squat flat to earth until I picked them up. No sooner would I lift one in my hand, however, than it would set up a loud peeping which generally brought the mother on a run. In one such instance the parent bird appeared over the crest of the hill, where she had skulked away at my approach, and came directly toward me with half-open wings, as if to drive me away. When within a few feet of me she turned quickly and ran in a wide circle about me, clucking all the while like a barnyard hen. Finding that her efforts to drive me away were of no avail she flew with whirring wings over the hill only to return and circle about me in the same way as before, still clucking loudly. This time the chicks left their hiding places, and, with subdued peepings, ran under cover of the vegetation in the direction of the place where the mother had taken a stand and when I left a few moments later not a chick was to be seen. At this time the young were light yellow in color beneath, tinged with warm brown dorsally and with two black stripes down the back, each stripe broken in two places, thus giving the appearance of six short black streaks. The head was brownish yellow dorsally, marked with a central row of blackish blotches and with smaller black markings in the post-ocular region.

About this time, also, I found several nests full of egg-

shells indicating the number of eggs in the set to have been in the neighborhood of thirteen, but did not discover a nest with the sitting parent or with the eggs yet unhatched, for the close-sitting bird would be almost impossible to see in the long grass of the hollows. The nests were merely places in the grass where the hen had settled the plants down on the ground and laid her eggs on top of the grassy mat. Even after the family had left there was scarcely a depression to mark the place, and the whole nest was so open and plainly to be seen that only the coloration of the sitting bird would conceal the situation from the would-be observer.

Later in the summer I came across flocks of the chicks grown larger, and then, instead of keeping close to earth, they would fly up and scatter over the hill, looking very small in comparison to the size of their mother. In reality they were about six or seven inches in length, but their flight was strong and direct although necessarily of comparatively short duration. Still later, in the latter part of August and early September, almost grown, they were joined by the old males, which, until then, had been off by themselves in small groups, and the combined flocks, often in company with Prairie Sharp-tailed Grouse, ranged the hills to feed, rising with whirring wings, when flushed, to settled again when they had put the crest of a hill between themselves and the observer. October 27-29, 1910, M. H. Swenk found them common in the sandhills about the Reserve, but not so abundantly as at the eastern edge of the sandhills in Custer county.

35. *Pedioecetes phasianellus campestris* Ridgway — Prairie Sharp-tailed Grouse.

Like the Prairie Chicken, the Prairie Sharp-tailed Grouse nests in the hills, where I frequently found the males during the summer, feeding in little flocks while the females were sitting and taking care of the young. One flock of the little chicks was all that I found, and that on June 18, 1912. The mother bird had flown with loud voiced "cuc'-cuc'-cuc'-cuc'----" but had dropped to earth and skulked rapidly over the hilltop, only to return in a moment and approach me closely and then flutter with apparently broken wing over the grass away from the spot where I

stood. This she repeated several times but at last gave up the attempt to lead me away and sought a position on a nearby rise of ground from which she called anxiously. At the beginning of her maneuvers I discovered one of the chicks at my feet, but further search proved to be useless, and not another one could I find, so well were they protected by their color and markings and so quiet did they remain. The chick that I found was in nestling down and resembled very much the downy young of the Prairie Chicken, although even at this age there was a difference in the amount of feathering on the tarsi, which character is so marked in the adults.

36. *Zenaidura macroura carolinensis* (Linnaeus)—Mourning Dove.

The dove is rather abundant on the Reserve, as it is elsewhere in the state, and is found everywhere from the underbrush along the river to the open hills. When nesting, it chooses the latter situation almost exclusively and constructs a twig-lined hollow on the ground in the shelter of a clump of bunch-grass or perhaps beneath a pine tree if it happens to be in a planted portion of the Reserve. The birds can be seen in the early morning coming to the river valley from the hills and returning again in the evening, since none of them, apparently, remain in the valley over night. Some of the nests discovered were fully a mile or more from the wooded river bottom, and none at all were found closer than the first adjoining hillside.

37. *Cathartes aura septentrionalis* Wied—Turkey Vulture.

At intervals throughout the summer of 1912, a buzzard could be seen sailing in broad circles high overhead on widespread, motionless wings. Numerous times a pair of them would be seen together and once I saw three. Whether or not the birds which I noted on the Dismal river were the same individuals as those which appeared from time to time in the other valley I cannot positively say, but I suspect such was the case since in the wide expanse of territory over which a buzzard ranges the few miles which separate the two streams would be inconsiderable. Probably the pair, or possibly two pairs, nested in the vicinity of the former stream.

38. *Circus hudsonius* (Linnaeus)—Marsh Hawk.

A pair of Marsh Hawks were seen at the Reserve during both years that I was there, and nested in the bottom of a deep hollow a short distance back from the river. I knew the nest to be situated somewhere in this particular hollow, but I could never flush the old birds from it and they would not alight near it while I was in the neighborhood, but would perch on nearby hilltops or fence posts and watch my every movement, occasionally flying over me with rapid "cac'-cac'-cac'-cac'---" but never giving me the least indication of the exact position of their home. On June 20, 1912, I was watching the pair from a distance when the female turned her course suddenly and slanted downward to a part of the valley which I had somehow overlooked during my explorations. I hurried down the intervening slope and this time had no difficulty in locating the nest on the ground in the middle of a thick growth of *Symphoricarpos*. There was little evidence of architectural ability apparent at the time; the nest was a mere flat mound of sticks, matted with excreta and having a few scattered bones and feathers lying upon it, the feathers from the plumage of the old birds and in all probability moulted rather than purposely removed. Six young birds were present, five of them well grown and hidden in the brush nearby, the sixth but little larger than when hatched and lying in the nest where it could do nothing but squirm and move its head about when I would have touched it. The healthy birds were beginning to develop quills and contour feathers, the latter for the most part on the back of the head where they formed a black, spike-like crescent or crown which gave the youngsters a peculiarly vicious appearance, especially when, on being approached, they edged off, opened their beaks and hissed sharply. Meanwhile the old birds circled about with anxious calls and began a series of downward swoops, shooting with great velocity directly toward me and when within but a few feet of me, turning and passing over my head at rather close quarters. Later in the summer I saw the young birds on the wing on numerous occasions, all of them resembling their mother more or less in their plumage of brown. The parents were seen all summer, hunting in the hills and in the river valley and the male was flushed

on one occasion from the carcass of a prairie-dog which I had left in the field after skinning it. This hawk was noticed by M. H. Swenk on October 28, 1910.

39. *Accipiter velox* (Wilson)—Sharp-shinned Hawk.

September 1, 1911, I secured a female hawk of this species which I had noted the day before for the first time in the region. September 1, 1912, exactly a year later, I saw a pair in almost the identical place. Probably the Sharp-shinned Hawk is a regular migrant at Halsey.

40. *Buteo swainsoni* Bonaparte—Swainson Hawk.

Very frequently during the summer of 1912 I noted a pair of Swainson Hawks near the Reserve, usually high in the air, circling about over the hills. On June 10 I discovered the nest in a hackberry tree which formed one of a group of such trees in a hollow about two miles back from the Loup river. The nest was a bulky structure about a yard in diameter and fully as much in height, two feet across the interior and about a foot in depth, and was constructed of sticks and lined with grass and rootlets. Its height from the ground was not over twelve feet. It contained three heavily incubated eggs, almost pure white in color but lightly tinged with pale green and faintly blotched with brown.

41. *Archibuteo ferrugineus* (Lichtenstein) — Ferruginous Rough-leg.

This hawk was noted in 1911 on several occasions from August 26 to September 21, but in 1912 I saw it only on May 19. Apparently there were no breeding birds near the Reserve during my observations, but R. H. Wolcott records a nest of the species from the region.

42. *Falco mexicanus* Schlegel—Prairie Falcon

On August 8, 1911, I saw a single Prairie Falcon in the valley near the Reserve station, the only time that I have seen the species in the sandhills. Without doubt it was a migrating bird.

43. *Falco columbarius* Linnaeus—Pigeon Hawk.

A single Pigeon Hawk was seen between Halsey and the Reserve station on September 3, 1911. It was in company with several Sparrow Hawks but did not seem to be

44. *Falco sparverius* Linnaeus—Sparrow Hawk.

During August and September, 1911, Sparrow Hawks were quite common at Halsey, and, although I had seen none in June of that year, I supposed that the birds were breeding ones. I found this conclusion to be false the following year, for the hawks were not present in May and did not appear in the region until August 3, although from this time on they were plentiful, both in the river valley and for a short distance back in the hills. Frequently they would alight on the crest of a sandhill where they would remain in silent inspection of the country until on a sudden impulse they would rise into the air and circle about in all manner of aerial gyrations to the accompaniment of their rapid "killy-killy-killy----" On one occasion a beautifully plumaged male settled itself on a post two or three yards away from where I sat under a pine tree and perched there silently, bobbing its head as it surveyed me fearlessly, and when it finally flew away it did so deliberately and without undue haste and remained in the immediate vicinity for some little time afterward, not in the least alarmed at my presence. Very probably some of these birds were referable to the Desert Sparrow Hawk.

45. *Pandion haliaetus carolinensis* (Gmelin)—Osprey.

F. M. Chapman includes a fish hawk in his list of the birds seen at Halsey. I did not see the species at any time.

46. *Asio flammeus* (Pontoppidan)—Short-eared Owl.

The only record for this owl is one made by R. H. Wolcott in July, 1911.

47. *Otus asio* (Linnaeus)—Screech Owl.

Several Screech Owls haunted the underbrush along the river and at the base of the hills whence their quavering call was heard nightly. Occasionally when exploring the thickets I would flush these little gray birds—none of the red phase were apparent—but usually their unmistakable voice was the only clue to their whereabouts. They are undoubtedly residents and probably breeders here.

48. *Speotyto cunicularia hypogaea* (Bonaparte)—Burrowing Owl.

Burrowing Owls are very common in the neighborhood of prairie-dog towns in the sandhill region and could be found at any time in such places, either perched on a neighboring fence post, if such there happened to be, or standing on a mound or in the entrance to one of the burrows. When alarmed they would give their peculiar "cack- cack- cack- cack- cack- cack- cack-----" and disappear down the burrow or take wing and fly off some distance and drop into the grass where they would remain motionless but on the alert until they deemed the danger too great, when they would again repeat the performance. Sometimes when standing in the entrance to their burrows they would gradually sink lower and lower, on being approached, until they had entirely disappeared under ground. They did not become so easily alarmed when approached by a vehicle or by anyone riding on horseback, but would stand bowing sedately in a manner ludicrous in the extreme, only seeking safety, if at all, when at rather close quarters.

At times an owl could be seen going through a performance which was most amusing. The solemn little actor combined bowing and blinking with turning from side to side so that it appeared to be bowing and nodding first to one side and then to the other, the whole proceeding so comical that I never tired of watching it. Frequently at dusk the owls could be seen hunting. Their method consisted of a hovering with rapid wing beats followed by a swinging flight to another position or a sudden and swift drop to earth. Usually the birds remained in the valleys, but one was seen hunting in the hills, and on August 31, 1912, I found a bird at the entrance to its burrow a mile or two from the valley and the nearest dog town.

At night the song of the owls could be heard in the vicinity of their nests, a peculiar, weird, "cuc-cuc-cuc-cuc-cuc----" repeated in a monotone so rapidly as to seem to roll, quite a different note from the alarm cackle. This song has been compared to that of our native cuckoos, but to me there is little in the one to suggest the other; the performance of the owls has a distinct sound which is characteristic although the difference between it and the note of the cuckoos is difficult to write in mere syllables.

49. *Coccyzus americanus* (Linnaeus)—Yellow-billed Cuckoo.

Cuckoos were found in the thickets along both rivers

and at the base of the hills, but of the two forms present this was the less common one in the neighborhood of the Reserve station although I saw it at intervals throughout the summer. It no doubt breeds here as does the Black-billed Cuckoo but I found no nests.

50. *Coccyzus erythrophthalmus* (Wilson)—Black-billed Cuckoo.

This cuckoo is a moderately common summer resident and breeder at Halsey. On June 8, 1912, I found a nest with a set of three eggs and the full set of four was completed on the following day. June 10, I found another nest with a single egg and with two additional eggs added by the 13th. These nests were at the usual low elevation, one of them in a low bush on the hillside facing the river, the other in a marshy place bordering the stream, on the top of an old willow stump around which had grown up new shoots of the tree, forming a shaded retreat in the center with a sort of stockade around it. This latter nest was lined with sprays of willow seed-pods.

51. *Ceryle alcyon* (Linnaeus)—Belted Kingfisher.

A pair of Belted Kingfishers had their nest somewhere back in the hills where the hard-packed, perpendicular side of a blowout furnished the only sort of situation in the region where they could excavate the horizontal burrow in which their eggs are laid. Just which particular blowout had been chosen by the birds I could not discover but they were often seen a half mile or more from the Middle Loup river and may very likely have nested even farther from the stream than that. In the valley of the Dismal, where the river in its windings has cut steep banks in the side of the hills along its edge, the kingfishers have undoubtedly made use of these banks for nesting sites, but the absence of such cuts on the Loup river near the Reserve station and the level condition of the shores of that stream have made necessary the sort of proceedure to which the birds there resort. The kingfisher was noted at Halsey October 28, 1910, by M. H. Swenk.

52. *Dryobates villosus* (Linnaeus)—Hairy Woodpecker.

A pair of Hairy Woodpeckers was noted September 22, 1911, among the trees at the base of the hills, and on August 27 the following year I saw a single individual in

the brush timber by the river. The Hairy Woodpecker, like most of the other woodpeckers which are found at Halsey, is a migrant there and does not breed.

53. *Dryobates pubescens medianus* (Swainson)—Downy Woodpecker.

A single Downy Woodpecker was observed across the river near the Reserve on August 29, 1912. R. H. Wolcott noted the species in July, 1908, but no other records are at hand of its occurrence at this locality, which is at about the western limit of distribution of the species in the state.

54. *Melanerpes erythrocephalus* (Linnaeus)—Red-headed Woodpecker.

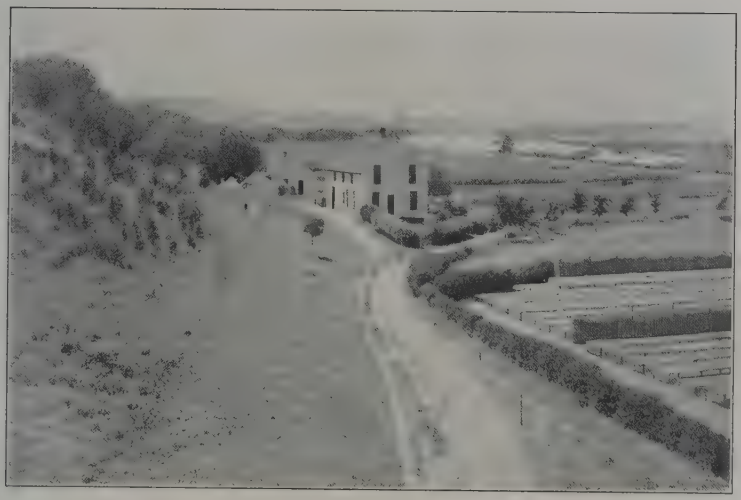
Red-headed Woodpeckers were present in moderate numbers and were noted up until May 30 when they disappeared not to be seen again until August 18, from which time on through September they were found as before. Usually they were among the trees along the river and at the base of the hills, or on telegraph poles and fence posts in the valley, but occasionally I would find them a mile or more out in the hills where they had followed a line of fence. On the first trip which I made to the colony of Great Blue Herons I saw this species among the trees which bore the heron nests and in another grove of larger hackberries about a half mile south of the heronry. Why the Red-headed Woodpeckers do not remain at Halsey and nest in the larger trees and telegraph poles it is hard to say since they are usually quick to adapt themselves to changed conditions, especially when such changes are in their favor.

55. *Colaptes auratus luteus* Bangs—Northern Flicker.

R. H. Wolcott reports the Northern Flicker as breeding at Halsey and gives records of its occurrence in June, 1906, July, 1908, and July, 1911. My own records date from August 29 from which time on I found the species rather commonly although I had seen none at all during the earlier part of the summer. During migration these birds are undoubtedly more abundant than at other times although they may possibly winter in numbers.

56. *Colaptes cafer collaris* Vigors—Red-shafted Flicker.

Red-shafted Flickers were seen from September 20 to 23,



Middle Loup Valley at Forest Reserve, showing the broad, flat stream margined with thickets, the grass-covered valley and woodland near the hill slope. Photo by R. J. Pool, 1912.

Sandhills back from the river valley, showing the covering of bunch-grass and the young planted groves of Jack Pine and Scotch Pine. Photo by R. J. Pool, 1912.

1911, and probably remained in the region still later, after I had left the locality. The species is not so common as the preceding one, although its numbers may increase during cold weather.

57. *Chordeiles virginianus virginianus* (Gmelin)—Nighthawk.
A single female of the typical eastern Nighthawk was taken September 3, 1912, a short distance out in the hills. Evidently here, as probably elsewhere in the state, the three native varieties of nighthawks overlap ranges during migration and all forms are of equally probable occurrence during that time.

58. *Chordeiles virginianus henryi* Cassin — Western Nighthawk.
On August 30 and 31, 1911, I saw several nighthawks which were so conspicuously rufous that I am inclined to think that they belonged to the form *henryi,* which breeds to the north and west of the Reserve in the Pine Ridge region and spreads eastward during migrations.

59. *Chordeiles virginianus sennetti* Coues—Sennett Nighthawk.
The Sennett Nighthawk is the common form of nighthawk breeding in the sandhills and is present throughout the summer from May until September. It nests on the hills, and there I have frequently flushed the birds from sandy places, bare or sparsely dotted with vegetation where I was certain that a nest, so called, was situated, but it was almost impossible to find a nest unless the spot from which the birds arose was accurately 'marked down.' A female Sennett Nighthawk collected as late as June 22 contained a fully developed egg in the ovary showing that nesting was still in progress.
In the evenings the nighthawks were common in the river valley and about the nursery beds, but in the daytime they were seldom to be seen except out in the hills. There their characteristic "peent" could be heard very frequently, often followed by the hollow, vibratory "whoo-óo-oo----" as a bird stopped itself suddenly in a headlong descent and began to mount upward again. The white patches on the wings rendered the birds moderately conspicuous even at dusk, when they accompanied the bats through the air in their insect hunting.

60. *Chaetura pelagica* (Linnaeus)—Chimney Swift.
On the evening of May 31, 1912, a lone Chimney Swift

was observed making its way up the Middle Loup valley. It was probably a belated migrant, since the species does not breed in this locality.

61. *Archilochus colubris* (Linnaeus)—Ruby-throated Hummingbird.

I secured a young male Ruby-throated Hummingbird on September 3, 1912, from the undergrowth along the Middle Loup river. This record extends the limit of distribution of this hummingbird in Nebraska for some distance westward. Previously the 98th meridian, lying about one hundred and fifteen miles east of Halsey, marked the supposed western boundary for this species. The Broad-tailed Hummer [*Selasphorus platycercus* (Swainson)] common west of here, has been found at Bassett, about thirty-seven miles east of the Reserve, so it might occur here also, although no records of its doing so are at hand.

62. *Tyrannus tyrannus* (Linnaeus)—Kingbird.

Kingbirds were quite common at Halsey up to the time of my departure on September 10, 1912, but had been absent on September 20 of the preceding year when I stopped at this locality again on my return from more western parts of the state. The intermediate period of September 10-20 probably includes the date of departure of the species. One nest with a set of four eggs was discovered on June 10 about eight feet from the ground in a willow overhanging the Middle Loup river, and numerous pairs of the birds were found along that stream, all of which were undoubtedly breeding. A single Kingbird was seen back in the hills on May 19, 1912, in the grove of large hackberries south of the heronry, but this was during migration and I do not suppose that the Kingbird will nest in that situation.

63. *Tyrannus verticalis* Say—Arkansas Kingbird.

The Arkansas Kingbird was not an abundant bird but was seen on several occasions throughout the summer of 1911 and 1912 and may have bred sparingly. It was noted in the undergrowth along both the Middle Loup and Dismal rivers, in the open valley, and in pockets back in the hills. One was seen several times about the little clump of hackberries that contained the nest of the Swainson Hawk, and I suspected the presence of its nest at that

place also, especially since this flycatcher frequently builds in close proximity to the nests of these hawks, but I could not discover the nest and only the single bird was seen. This species occurs on the Reserve more commonly in migration than at other seasons, and was noted from May to September.

64. *Sayornis sayus* (Bonaparte)—Say Phoebe.

F. M. Chapman reports Say Phoebes as present during early May migration in 1906, but his record is unique. The species breeds north of Halsey along the Niobrara and elsewhere in the state westward, but does not appear at this locality except as a migrant.

65. *Myiochanes richardsoni* (Swainson)—Western Wood Peewee.

I noted the Western Wood Peewee in 1911 in the shrubbery along the Middle Loup river, where I saw individuals on August 21 and 28. None were seen during 1912 although the birds observed the year before may have bred in the locality during the summer. One specimen, an adult male, was taken on August 21, 1911. This species has been seen along the Dismal river in the neighborhood of Thedford and is reported by L. Bruner.

66. *Empidonax trailli* (Audubon)—Traill Flycatcher.

Traill Flycatchers were seen from May 15 to June 10, 1912, and occurred irregularly in August of the preceding year from the 21st to the 31st. A male was taken August 21, 1911, and a pair was secured on the 31st of that month. The birds seen in 1911 might have bred in the region, but none were observed during midsummer in 1912. R. H. Wolcott, however, records the breeding of the species in the locality and it may nest in places regularly. The habitat frequented by these flycatchers was the plum brush along the river and the undergrowth at the base of the hills, the latter less commonly.

67. *Otocoris alpestris leucolaema* (Coues) — Desert Horned Lark.

Desert Horned Larks were found to be common in certain situations on the Reserve and undoubtedly bred. A few were seen in the river valley in the plowed fields, but the majority kept to the hills and the largest number were observed at the stock windmills, where the constant tramp-

ling of the cattle clears a large area around the water tanks, destitute of vegetation but furnishing a good feeding ground for the birds. Often their cheery call would be noted from overhead, and occasionally their more protracted song as a bird would rise in spiral curves high into the air or poise itself on fluttering wings a short distance above the earth. The pale grayish brown and pink of these larks is by no means conspicuous against the light colored sand, and even when I knew that there were birds just ahead of me it required some effort, at times, to make them out, especially if they chose to remain motionless. F. M. Chapman refers the horned larks which he saw at Halsey to the prairie form, *O. a. praticola*, but I believe that the resident sandhill birds are nearer the present variety —at least a female and a male which I took on May 21 and June 1, 1912, respectively, easily referable to this subspecies. The Desert Horned Lark was noted at Halsey, October, 1910, by M. H. Swenk and probably occurs throughout the year.

68. *Pica pica hudsonia* (Sabine)—Magpie.

A flock of six birds was noted along the Loup east of the Reserve, October 28, 1910, by M. H. Swenk.

69. *Cyanocitta cristata* (Linnaeus)—Blue Jay.

Several Blue Jays were present in the thickets and scattered timber along the valley. R. H. Wolcott records the finding of Blue Jay nests in July, 1911, but I was not so fortunate, although I saw the birds frequently during the summer.

70. *Corvus brachyrhychos* Brehm—Crow.

One or two Crows were noted in the Loup valley from the 26th to the 23rd of August, 1911, but none were seen the following year. The sandhills do not tempt these birds as do more heavily wooded and more cultivated parts of the country. In latter October, 1910, M. H. Swenk did not find the Crow present at Halsey, but at Hazard, about eighty miles southeast, a flock of over 100 birds was conspicuously in evidence.

71. *Molothrus ater* (Boddaert)—Cowbird.

I saw a few Cowbirds throughout the summer in the valley and hills, although I did not find any evidence of their parasitism in the nests of other birds. More of them were

seen in spring than at any other time, usually in the valley where they were following the cattle.

72. *Xanthocephalus xanthocephalus* (Bonaparte) — Yellow-headed Blackbird.

On September 3, 1911, I saw a flock of about sixty Yellow-headed Blackbirds in a cornfield in the Loup valley; May 17, 1912, I observed a single bird of the species, and September 10 of the latter year the last birds that I saw as my train left Halsey were these blackbirds—a flock of them down by the river. The Yellow-headed Blackbird breeds locally in the sandhill marshes of the state, but was not observed near the Reserve during the summer, probably because of the absence of any extensive tracts of suitable marsh land. It is reported as a common migrant by men on the Reserve, and was seen by F. M. Chapman in May, 1906.

73. *Agelaius phoeniceus* (Linnaeus)—Red-winged Blackbird.

Numerous Red-winged Blackbirds nested along the river at Halsey where I found their nests placed in various situattions, from the ground up to six or eight feet above it. The birds frequented marshy parts of the river bank more commonly than other situations and were never seen farther away from the water than the open valley land. There is great probability that some or all of these birds should be referred to the western form *A. p. fortis* Ridgway but no specimens were taken to prove this supposition.

74. *Sturnella magna* (Linnaeus)—Meadowlark.

Chapman speaks of a single typical eastern Meadowlark which he both saw and heard at Halsey on the 5th of May, 1906. This record is unique for the locality but the bird was probably a member of a local colony of eastern Meadowlarks which breeds in the lake region of Cherry county, adjoining Thomas county on the north.

75. *Sturnella neglecta* Audubon—Western Meadowlark.

The Western Meadowlark is a very common summer resident and breeder in this region. On various occasions in May and early June I flushed the birds from their nests in the tufts of bunch-grass that dot the hills. So well are the nests placed and so alike are the various bunches of grass that a return to a given tuft and its occupants is decidedly uncertain unless the place has been marked by

some means or other. I found no nests in the valley or far back in the hills but all that I discovered were on the first slope facing the river or within a few ranges. Western Meadowlarks were seen on numerous occasions in other habitats, however, and may very possibly have bred there. In the late fall these birds tend to shift eastward to the edge of the sandhills, for on October 27-29, 1910, M. H. Swenk did not see or hear the species on the Reserve, but from Anselmo, twenty-five miles southeast of Halsey, eastward across the state it was common.

76. *Icterus spurius* (Linnaeus)—Orchard Oriole.
At least two pairs of Orchard Orioles bred in the underbrush along the Loup river near the Reserve station, and one nest with four eggs was found on the Dismal river on June 16, 1912. During 1911, I saw but a single bird, on June 8.

77. *Icterus galbula* (Linnaeus)—Baltimore Oriole.
A single male Baltimore Oriole was seen in the thickets along the river on June 7, 23, and 28, 1912. It may have bred in the vicinity but I saw only the male bird and did not discover any nests so its breeding here is in question.

78. *Euphagus carolinus* (Muller)—Rusty Blackbird.
I noted this blackbird on September 22 and 23, 1911, in small flocks in the valley of the Loup river. I did not see it the following year, probably because I left in the fall before its arrival.

79. *Euphagus cyanocephalus* (Wagler)—Brewer Blackbird.
Like the preceding species, the Brewer Blackbird was not seen in 1912, although it was noted in 1911. It appeared in small numbers from September 21-23, of that year. F. M. Chapman also lists the species as occurring in May, 1906.

80. *Quiscalus quiscula aeneus* Ridgway—Bronzed Grackle.
A very few Bronzed Grackles were noted at intervals during 1912 until the middle of July, but none were seen after that time and I do not think that those which remained up until then bred in the region. The timbered growth along the river seemed to be the habitat most frequented by the species.

81. *Astragalinus tristis pallidus* (Mearns)—Pale Goldfinch.
Goldfinches were plentiful in the thickets along the river and at the base of the hills, as well as in the planted groves in the valley, and occasionally I would meet with them out in the hills, especially in autumn when the sunflowers filled the hollows and covered the southern hill slopes in masses acres in extent. On the yellow heads of the sunflowers the birds were often found devouring the seeds, and so well did they harmonize with their surroundings when in such situations that it was often difficult to see them even when I heard their plaintive "swee-ee-eet" and knew that they were in the neighborhood. Several specimens which were taken all seem to belong to the pale western form which is the resident breeder in the Pine Ridge region, also. Two birds were noted near the Reserve buildings October 28, 1910, by M. H. Swenk.

82. *Spinus pinus* (Wilson)—Pine Siskin.
A specimen was taken by M. H. Swenk October 28, 1910, and was the only individual noted. Probably it occurs regularly if not commonly at the Reserve.

83. *Pooecetes gramineus confinis* Baird—Western Vesper Sparrow.
One of the common, although not abundant, birds to be seen on the Reserve was the Western Vesper Sparrow. It was met with during early summer in the open valley and in the hills, on the grassland or among the planted pines and thickets whether of choke-cherry and plum or the lower-growing *Symphoricarpos* and *Ceanothus.* As the summer advanced it was seen more frequently in the open hills and less in the other habitats. I hunted through the whole of May and June for nests of the species but without success and had given up thoughts of finding any by the end of the latter month, but on July 8 I was surprised to discover two nests, one with three eggs, the other with four. These eggs were elongate-oval, in color a pale greenish white, splotched, very heavily in one set and less so in the other, with reddish-brown and lilac and marked sparingly with black lines and dots. Both sets were heavily incubated at this time. The nests were built of grasses and lined with rootlets and horse-hair and were placed in similar situations—a tuft of bunch-grass in the hills—with the opening to the cavity so inconspicuous that I never would

have suspected the real nature of either place had not the sitting birds fluttered away to avoid being stepped upon.

84. *Ammodramus savannarum bimaculatus* Swainson.
Western Grasshopper Sparrow.

The little Western Grasshopper Sparrows are a familiar companion of your travels in this region and are frequently met with in the river valley although they are much more numerous back in the hills, where they outnumber the other birds found there. When traversing the grass-covered slopes it is a frequent occurrence to flush from underfoot a little grayish-brown shape which skims the tops of the grasses for a short distance with wavering flight, drops suddenly out of sight and skulks rapidly under cover of the vegetation to another position. When you approach the place where you saw it disappear nothing is to be seen of it, but, as you move about in an attempt to flush it again, the elusive bird comes up on one side and you turn your head only in time to see it dropping from sight again. When flushed from the nest the parent birds frequently travel some distance, skulking behind clumps of grass and weeds or even under cover of vegetation so sparse that you wonder it can shield any moving thing, and the first indication that you have of the presence of a bird is the sight of one rising from a little patch of grasses which, as you may afterward discover, is some distance from where the bird started to run and quite destitute of any nest. Sometimes, especially when young are in the nest, the mother sits close and flies only when discovery is imminent, and at such times the usual procedure is for her to try to lead you away by feigning a broken wing and therefore appearing easy of capture. On June 18, 1912, I found a nest which contained four young birds. This nest was on the slope of the hills facing the river, the only one so discovered since all the others that I found were back in the hills. On June 6, I found a single egg of the species lying by itself in the open prairie with no nest of any kind near. June 24, I discovered a nest with a single egg, and on June 27, R. J. Pool showed me a nest which he had found which contained a full set of five. On July 11, I discovered still another nest, this time with four fully-feathered young which more than filled the nest. The little birds remained perfectly quiet after the parent had fluttered off, until I touched one of them when they broke

forth from the place like an exploding bomb-shell and scattered in four different directions, leaving behind them a single infertile egg.

The nests of these sparrows are usually placed on the ground in the shelter of a tuft of bunch-grass and are built of grasses and lined with finer plant fibers and rootlets. One of the nests I found was so arranged that the bare ground formed part of the lining, so thin was the inner construction. The eggs are short-oval and rounded, white in color, frequently tinged with pale blue, and are spotted more or less generally all over with reddish-brown.

The song of the Western Grasshopper Sparrow, heard most frequently during the nesting season, is a cheery "pittuck-zee-ee-ee----" which is given from some elevated perch. A yucca pod on its slender stalk is a favorite position and thence may come the little insect-like trill with more or less steady persistence through the heat of the day, often when all the other birds are silent and seeking the cooler shades of the plant growth. The call note is a weak reiterated "pit" and is heard frequently as an expression of anxiety concerning the nest. It is also heard commonly in the late summer when often the only times you see the birds are when you flush them from under foot.

85. *Chondestes grammacus strigatus* Swainson—Western Lark Sparrow.

The prettily marked Western Lark Sparrows were, with the exception of the Western Field Sparows, the commonest birds of the region. They occurred everywhere from the open hills to the river bottoms, nesting on the ground in the valley and on the hillsides facing it, and on one occasion even in the hay filling of a windbreak in the nursery beds on the Reserve, four feet from the earth. Sometimes the nests were in the protection of a low bush or plant but often they were in the open, a little hollow in the ground lined with grasses, rootlets and hair from the cattle and horses on the range. The eggs, four in number in most cases, were laid in the latter part of May and June. May 31, 1912, I found a nest which was without eggs at that time; several days later it contained three eggs, but still later it was empty and the nest partly torn up although there was nothing to indicate how the eggs had disap-

peared. The old birds remained near the nest but they did not build again nor did the female lay again in the old nest.

The trusting and fearless nature of these sparrows was always in evidence Often they would merely hop a few steps out of the way of an approaching observer and go about their business of picking up seeds from the prairie roadside as though no one was within their horizon. If sufficiently startled they might fly, but it was rarely for any great distance. When flushed in this manner the conspicuous white border of the tail became very noticeable as the birds spread that member in flight.

The call note of these Western Lark Sparrows is not particularly distinctive although it is easy to recognize when heard, but their song an exceedingly rich and varied mixture of whistled notes, quite sustained and with a distinct undercurrent of a peculiar buzzing or purring nature, hard to descibe but quite unmistakable and characteristic. The birds could be heard singing throughout the day at the Reserve, and frequently even at night their song was noted when the Screech Owls and the Long-tailed Chats led the nocturnal choir.

86. *Zonotrichia querula* (Nuttall)—Harris Sparrow.

When I reached Halsey in 1912 there was a single belated Harris Sparrow in the neighborhood of the Reserve. I saw it on May 15 in a thicket at the base of the hills and May 17 I found probably the same bird in the brush along the river. The species is very likely in this region both a migrant and a winter resident during mild seasons, since it was noted commonly by M. H. Swenk October 27-29, 1910.

87. *Zonotrichia leucophrys gambeli* (Nuttall)—Gambel Sparrow.

I saw a dozen or more Gambel Sparrows on September 21 and 22, 1911, in the plum brush along the river. F. M. Chapman lists the species in May, 1906 and it is very likely of common occurrence during migrations early in the spring and late in the fall.

88. *Spizella monticola ochracea* Brewster—Western Tree Sparrow.

"The most abundant bird in the locality, October 27-29, 1910." (M. H. Swenk).

89. *Spizella passerina* (Bechstein)—Chipping Sparrow.
On August 20 and September 23, 1911, I noted Chipping Sparrows in the brush along the Middle Loup river. In the spring of 1912 I saw a very few individuals at intervals from May 15 to May 24, in situations ranging from the open hills to the river underbrush, and usually in company with the more plentiful Clay-colored Sparrows. It was found breeding among the pines on the hillside back of the Reserve by R. H. Wolcott, but I saw it only during migration.

90. *Spizella pallida* (Swainson)—Clay-colored Sparrow.
Present at Halsey when I arrived on August 21, 1911, this sparrow was noted from that time on through September. It was again present when I reached the locality in May, 1912, and remained until May 24, disappearing then but reappearing about August 23, and remaining at least until I left the region on September 10. It is found in all possible situations during migration, but frequents the brush in greatest numbers, especially that in the river valley, either along the stream or back at the base of the hills.

91. *Spizella pusilla arenacea* Chadbourne — Western Field Sparrow.
The Western Field Sparrow was one of the most abundant and generally distributed birds at Halsey during the summer, and was found from the earliest to the latest dates that I was at the Reserve, May 15 to September 24, while F. M. Chapman records it still earlier, May 3-6, 1906. Every pocket in the hills, every little hollow with a clump of shrubs in one corner, as well as the brush along the river and against the first slope of the hills contained a pair or more of these little sparrows, whose simple but musical song, with its rising inflection ending in a trill, was a pleasing part of the general chorus, although frequently heard in company with only the Western Grasshopper Sparrows and Western Blue Grosbeaks.
The nests of the Western Field Sparrows were constructed of grasses and soft weed stems and lined with fine rootlets. They were placed at low elevations in wild rose bushes, plum trees, low shrubs like *Symphoricarpos* and *Ceanothus* or other such situations, sometimes almost on the ground. One nest that I found was a beautiful structure, the outer part of it a slaty gray in color while the

rootlets which formed the lining were a deep yellow and served to set off by contrast the five pale bluish-white eggs, spotted and scrawled with brown and gray.

92. *Junco aikeni* Ridgway—White winged Junco.

On October 27, 1910, two White-winged Juncos were seen in a flock of the following species about the seed beds, by M. H. Swenk.

93. *Junco hyemalis connectens* Coues—Shufeldt Junco.

"Abundant everywhere but especially about the seed beds, October 27-29, 1910. On the 27th a specimen was taken" (M. H. Swenk).

94. *Melospiza melodia melodia* (Wilson)—Song Sparrow.

Song Sparrows were noted only in the fall and had probably left the region before my arrival in the spring, since I saw none at that time. They were present when I reached Halsey on August 21, 1911, but the following year did not appear until the 27th of that month. They remained at least until the 23rd of September in 1911 and were noted commonly by M. H. Swenk on October 27 and 28, 1910, so they may, under favorable conditions, stay throughout the winter in the brush along the river.

95. *Melospiza melodia juddi* Bishop—Dakota Song Sparrow.

On September 21, 1911, I saw one song sparrow which was apparently distinctly referable to this form. The Dakota Song Sparrow is not uncommon over the whole of Nebraska during migrations and even occurs during winter in the southern part of the state.

96. *Melospiza lincolni* (Audubon)—Lincoln Sparrow.

On September 21, 1911, I saw two Lincoln Sparrows in the brush by the river and the same number, very likely the same birds, the following day. August 28 and September 6, 1912, I saw single birds in the same general locality as during the preceding fall. The species probably migrate through the region in moderate numbers.

97. *Pipilo maculatus arcticus* (Swainson)—Arctic Towhee.

Although not so common as the Western Lark and Western Field Sparrows, the Arctic Towhees were rather numerous in the undergrowth throughout the valley, particularly that at the foot of the first range of hills. I found no nests or eggs, but I discovered the young from the nest on

several occasions—little mottled and streaked fellows which usually remained quiet until picked up, when they would set up a cry which brought the parents in anxious haste. F. M. Chapman lists the Arctic Towhee as present in great numbers early in May, 1906.

98. *Zamelodia melanocephala* (Swainson)—Black-headed Grosbeak.

A pair of Black-headed Grosbeaks bred in the thicket along the river during the summer of 1912 but I was never able to discover the nest. Both birds were seen quite regularly up until the 10th of June, but after that time they were noted only at long intervals—possibly the cares of nesting kept them busy near the nest. During 1911 I had seen the species only on June 9 and August 20. On May 19,1912, I saw a single individual far back in the hills in a pocket of hackberries which was situated south of the colony of Great Blue Herons. During the summer, however, the birds confined themselves to the thickets along the river and at the foot of the hills where their grosbeak call-note, which always reminds me of the sound of a pair of rusted shears, could often be heard and frequently served to indicate that the birds were near. They did not sing much at any time, but occasionally in the spring and the earlier part of the summer I would catch the notes of the true song from across the river, although the singer remained hidden near the tops of some of the taller trees.

99. *Guiraca caerulea lazula* (Lesson)—Western Blue Grosbeak.

Quite regularly all summer up until August 29 in 1911, and August 30 in 1912, I found Western Blue Grosbeaks at home from the thickets at the base of the hills to the pockets far back from the river. One nest was discovered on July 10 which contained a single pale blue egg that had disappeared when I returned to the place a few days later. This nest was situated about three feet from the ground in in a choke-cherry bush in the same pocket that contained the hackberries with the nest of the Swainson Hawk.

The male of this pretty sparrow, the only bird of its color to be found in the depths of the hills, is a conspicuous object as he flies nervously about or perches on a weed stalk, uttering his sharp "quit." The female is not so conspicuous in her dress of more sober brown. I rarely heard the full song of this grosbeak, but although it is a

creditable performance it is inferior to that of the Black-headed species.

100. *Passerina amoena* (Say)—Lazuli Bunting.

R. H. Wolcott records the Lazuli Bunting from Halsey. I have no other records of its occurrence here, although it may migrate regularly, probably not commonly, through the region. It has been noted repeatedly as far east as Lincoln.

101. *Spiza americana* (Gmelin)—Dickcissel.

I found Dickcissels throughout the summer of 1912, from May 29 to August 13, and had seen them on June 8 and 9 and August 22 of the preceding year. Apparently the birds breed in the river bottom, for it was there that I saw them most commonly. Rarely they extended their wanderings over the first row of hills, and I have a female which I secured in a pocket growth in such a situation on August 22, 1911.

102. *Calamospiza melanocorys* Stejneger—Lark Bunting.

I have relatively few dates for the occurrence of the Lark Bunting at Halsey. On June 9, August 20, and September 2 and 3, 1911, and irregularly from May 15 to June 10, 1912, I saw the species. The 1911 records are of flocks, some of them of rather large extent; May 19, 1912, one flock was seen but the other records for that year refer to individual or paired birds. I do not think that the species nests commonly in this particular region although it may breed at no great distance, as is evidenced by the numbers of mated pairs that I saw. R. H. Wolcott has found the bird breeding here, however, and records it in July, 1908 and 1911.

The call note of the Lark Buntings, a gentle "who-ee-ee," with gradually rising inflection, was heard frequently, and when given by a flock in chorus as the birds rose from the ground before you or settled again a short distance away was most pleasing. The true song, which is given by the males, as I have heard it here and on the high plains where the buntings breed abundantly, is, to me, strongly suggestive of the notes of the Long-tailed Chat. In addition to the similarity of the notes the singing bird frequently performs in a manner that also calls to mind the same other feathered clown, and if the proceed-

ing be seen at a distance and in such a light that the colors and markings of the bird are obscured, the illusion is all the more complete except that wonder may arise as to what a Chat is doing in the open hills. The song is composed of syllables or repetitions of syllables pieced together in a more or less regular fashion. Some of the notes may be expressed as, "cheerp' -cheerp' -cheerp' cheerp' -chee-ee-ee-ee-ee-hir' -ta-hir' ta-hir' ta-who-oo-oo oo-oo-yor' da-yor' da-hurt'-hurt'-hurt'-ee-ee-ee-ee-ee-ee--" This is delivered most frequently by a bird on the wing, but it may be given from a perch on a fence post or weed stalk. When the bird sings thus in flight it rises regularly and directly into the air with rapid wing-beats until, at the summit of its ascent, it pauses and begins to descend by a series of awkward, jerky motions of its set, extended wings, the motion being more like that of a butterfly than of a bird. The performance is peculiar, and the song, from the representation I have given it, may seem to be anything but musical but in reality it is very pleasing. River valley and hills are the habitats by preference of the species; the main requirement is open country.

103. *Petrochelidon lunifrons* (Say)—Cliff Swallow.

I saw one or two migrating Cliff Swallows on June 1, 2 and 7, 1912, in the valley of the Loup river.

104. *Hirundo erythrogastra* Boddaert—Barn Swallow.

Barn Swallows nested at suitable places along the river valley and frequently came past the Reserve on their foraging expeditions, although none nested near the station. F. M. Chapman found them present on May 3-6, 1906.

105. *Iridoprocne bicolor* (Vieillot)—Tree Swallow.

Two Tree Swallows were among the migrants at the Reserve on May 23, 1912, evidently on their way to breeding grounds to the northward, possibly along the Niobrara river in the county adjoining on the north, where they are known to nest. This swallow was found here by F. M. Chapman also, May 3-6, 1906.

106. *Riparia riparia* (Linnaeus)—Bank Swallow.

On the Dismal river the present species was equally common with the following form, breeding in the banks formed by the stream in cutting down the adjoining hills. On the Middle Loup river these swallows were present

only during migrations and none were seen after the first week in June in that valley. Evidently the lack of suitable nesting sites in immediate proximity to the Loup river has deterred the birds from breeding there and they do not seem to have adapted themselves to conditions as perfectly as have the Rough-winged Swallows.

107. *Stelgidopteryx serripennis* (Audubon)—Rough-winged Swallow.

This swallow was moderately common along the Loup and Dismal rivers, breeding in cut banks along the latter stream but forced by the nature of the country along the Loup, near the Reserve station, to retire back into the hills, where the action of the wind in forming the numerous blowouts has packed the sand on one side of the hollows enough to permit the excavation of a burrow there. So far as I know the swallows do not go very far back from the river, but usually select a suitable site on the first range of hills or on one not far from it. They were commonly seen coursing above the river as well as circling the hills in the neighborhood of their nests.

108. *Bombycilla garrula* (Linnaeus)—Bohemian Waxwing.

On October 17, 1906, three specimens of the Bohemian Waxwing were shot from out a flock at the Reserve by one of the men and two of them forwarded to the University for naming. (See M. H. Swenk, Auk, xxiv, p. 223).

109. *Lanius borealis* Vieillot—Northern Shrike.

Individuals of the present species were noted on October 27 and 29, 1910, by M. H. Swenk.

110. *Lanius ludovicianus excubitorides* Swainson—White rumped Shrike.

From August 20 to September 3, 1911, I noted this Shrike irregularly and supposed that the birds I saw were the members of a family raised somewhere in the neighboring plum brush along the river. In 1912 I noted this Shrike on August 18, but as it was the only one seen throughout the entire summer I doubted my conclusions regarding the birds of the preceding year. It is possible, however, that the species breeds at certain places along the river, although the fact is yet unproved.

111. *Vireosylva olivacea* (Linnaeus)—Red-eyed Vireo.

On May 21, 24 and 30, 1912, I saw several Red-eyed Vireos in the trees along the bank of the Middle Loup and at the base of the first range of hills. On August 28 and 30, the species was noted again, as it had been from August 22 to September 3, in 1911. The breeding of the species is probable, but, in the absence of definite records, uncertain.

112. *Vireosylva gilva* (Vieillot)—Warbling Vireo.

On August 22, 1911, I saw a lone Warbling Vireo in a thicket near the river and on May 25 the following spring, in the same bit of undergrowth, I secured a female, also a solitary bird. No indications were present during the summer of the breeding of the species at this locality, although R. H. Wolcott noted the bird in June, 1906, and July, 1908.

113. *Vireo belli* Audubon—Bell Vireo.

The Bell Vireo is the commonest of the vireos which occur at Halsey, and breeds commonly in the dense thickets of plum brush, haw, willow and dogwood that line the river bank in places. Only one nest was discovered. This one was about a foot and a half from the ground in a haw and was first found on June 1, uncompleted, and later, on June 7, with the complement of four eggs. It was hung in the usual semipensile manner and was constructed of grasses, bits of corn husk and a few odd scraps of paper, the whole stuccoed with filaments of spider web and lined with fine plant fibers.

These little inconspicuous vireos confine themselves to the scrub thicket in the river valley whence their harsh "cheeow" is often heard, especially when the birds resent your invasion of their provinces. Their song is a hurried sequence of notes for which I have never found adequate representation in syllables, but it harmonizes well with the active, restless disposition of the creatures, which seem never to be still for a moment but move continually about through the network of brush, now appearing on one side of the observer, now on the other, and frequently reviling you with their queer explosive calls.

114. *Mniotilta varia* (Linnaeus)—Black-and-White Warbler.

The "wee'zy-wee'zy-wee'zy-wee'zy-wee'zy - -" of the

Black-and-White Warbler was a familiar sound in the timber along the base of the hills at the station, and was sometimes heard nearer the river as well. There were several pairs of the warblers in the vicinity of the Reserve station and all of them probably nested along the base of the hills.

On June 4, 1912, I was working on the hillside just back of the Reserve station when I heard one of these warblers singing nearby. I looked around for the bird in the hopes of discovering it in some place which might shelter its nest for I had heard the warbler in the same part of the grove for a number of mornings previously. I did not see the bird this time but my eyes fell on a clump of small trees farther up the slope where the grassy hillside was shaded and where it seemed probable that a search for a nest would be rewarded. I started up the hill and entered the small group of trees, and had barely passed through it when I found myself looking into the entrance of a little hollow in the grass, through which I could see the black and white striped head and watchful eyes of the sitting bird. At my nearer approach she flew from the tuft of grass, disclosing a nest built of grasses and lined loosely with horse-hair, and placed squarely on the ground in the shelter of a little bank. The nest contained five eggs.

115. *Vermivora celata* (Say)—Orange-crowned Warbler.

One or two Orange-crowned Warblers were noted in the thickets of the Loup river on May 15, August 28 and 30, and September 6, 1912. None were seen the preceding year.

116. *Vermivora peregrina* (Wilson)—Tennessee Warbler.

During the spring migration in 1912, Tennessee Warblers were not uncommon in the trees at the base of the hills and along the river, where I noted them from my arrival on May 15, until May 25. No individuals were noted during the fall migration up to the time of my departure on September 10, although they may have come in later.

117. *Comsothlypis americana usneae* Brewster—Northern Parula Warbler.

On September 7, 1912, when I was exploring the shrubbery along the river in a place where the growth was so

dense that I was obliged to stoop and crawl along in order to make any progress, I came at last to a little open place where I could stand erect. Hardly had I straightened up when I caught sight of a Northern Parula Warbler only a few feet away, where it was flitting about in a low plum tree. Since Northern Parula Warblers are by no means of common occurrence in Nebraska, especially in the sandhill region, I secured this one, which proved to be an adult male.

118. *Dendroica aestiva* (Gmelin)—Yellow Warbler.

Yellow Warblers were common in the spring and fall migrations and a few were observed from time to time along the river throughout the summer. Possibly the species breeds sparingly in the region although I cannot be sure of this in the absence of the definite discovery of a nest.

119. *Dendroica coronata* (Linnaeus)—Myrtle Warbler.

I saw and watched a Myrtle Warbler on May 15, 1912, as it hunted insects among the willows on a little sandbar island in the Loup. The species cannot be considered as very common here, although it may be more or less regular. F. M. Chapman reports it earlier in May than my own notes record it.

120. *Dendroica audubоni* (J. K. Townsend)—Audubon Warbler.

On May 15, 1912, I saw what I at first took to be another Myrtle Warbler, among the taller trees growing against the first range of hills. A second glance proved my error, for the bird had a yellow throat, and I knew it then to be an Audubon. I secured it and it proved to be a male. The occurrence of the Audubon Warbler here is not entirely acidental, for it breeds not far to the westward and spreads eastward during migrations, at which time it has been recorded from Lincoln. Occasionally the species wanders far from its normal range, and has been found even as far east as Massachusetts and Pennsylvania.

121. *Dendroica striata* (J. R. Forster)—Black-poll Warbler.

Migrating individuals of this warbler were seen on May 16, 22, and 25, 1912, in the "woodland" at the base of the hills and along the river. I saw no birds in the fall, nor had I found it during the preceding year. F. M. Chapman noted the species in early May, 1906.

122. *Seiurus aurocapillus* (Linnaeus)—Ovenbird.

The Ovenbird is apparently a regular migrant on the Reserve. On August 21 and 22, 1911, May 17, 21, and 23, August 29, 30, and 31, and September 3, 1912, I noted the species in the region. The thickets in the valley, both against the hills and along the river, were the customary habitats and there I often had the pleasure of watching these little walking warblers and of hearing their ringing "teacher-teacher-teacher-teacher - -." Usually the birds came to me as I sat quietly on the ground in the shelter of the dense undergrowth; frequently I have come upon them in my wanderings, sometimes unexpectedly, at other times led by the sound of their call to search them out. At all times they were quite fearless and promenaded along the branches of a low tree or over the ground either in silent inspection of me or going about their business as though I were nowhere near. Even when alarmed they departed without undue haste but nevertheless disappeared so completely that no amount of searching revealed the little hermits.

123. *Seiurus noveboracensis notabilis* Ridgway — Grinnell Water Thrush.

August 29, 1911, and May 22, 1912, are the only dates which I have for this migrant. On the former occasion I secured a fine male from the shrubbery along the river, where I had heard its familiar note for some time before I was able to find the bird. It was finally discovered in a willow overhanging the stream, but I was forced to get out into the water before I could see the creature, so closely did it keep to the shelter of the bank.

124. *Geothlypis trichas* (Limnaeus)—Maryland Yellowthroat.

Maryland Yellowthroats were present all summer in the valley, breeding in suitable places along the river and voicing their cheery "wree-chi-ty-wree'chi-ty-wree-chi-ty - -" from the shrubbery and weed patches that lined the margin of the stream. Common enough during the breed-season, they were still more abundant during migration and could be heard then, as indeed at other times, more often than they were seen.

125. *Icteria virens longicauda* Lawrence—Long-tailed Chat.

The self-assertive chat was a prominent inhabitant of

the thickets in the river valleys, where it bred commonly. One nest, discovered on June 9, 1911, was placed in a willow five or six feet from the ground. It was composed of grass and plant fibres and contained four eggs.

During the nesting season the voice of the chats could be heard on every hand in the valley region but the singers themselves were not so much in evidence. At rare intervals you could catch a glimpse of brilliant yellow through the vines and tangle of interlaced branches, but it was only for a moment. Attempts to stalk the singer usually failed and were you not acquainted with the bird and its ways you might have been led to believe in the existence of a disembodied voice, so persistently did the creature elude you. Occasionally you might see a chat rising from the brush into the air but pausing suddenly to turn and descend again, resembling a bird less than an awkward, loose-jointed assortment of legs, wings and tail, all the time keeping up the jumbled variety of catcalls and whistles which you heard from the thicket before the performance started. One of the birds in the vicinity of the Reserve had a "cack'-cack'-cack' - - -" so like that of a Magpie that I almost allowed myself to be deluded several times with the idea that a bird of the latter kind was in the neighborhood.

On June 18, 1912, one of my mammal traps in the brush along the river was robbed, the thief leaving only the mangled head of the mouse which had been caught. I reset the trap, using the remains of the carcass as bait, and the next morning found a female chat in it. Whether the bird had been the thief of the preceding night, or was merely making a curious investigation or perhaps was caught entirely accidentally, I cannot say.

126. *Wilsonia pusilla pusilla* (Wilson)—Wilson Warbler.

On August 21, 1911, I collected a specimen of true eastern *W. p. pusilla* in the undergrowth near the river and I saw others on September 22, both there and at the base of the hills. On August 29 and 30, 1912, a single individual was present in the first-mentioned habitat. F. M. Chapman lists the species in May, 1906. It and the following variety are probably both regular migrants at this locality although I do not think the present form extends

its wanderings much farther west in Nebraska than this point.

127. *Wilsonia pusilla pileolata* (Pallas)—Pileolated Warbler.
On September 21 and 23, 1911, I saw several warblers, distinctly referable to this variety of the species, among the willows and dogwoods near the river. Like the Wilson Warblers their characteristic "chib" often identified them as far as the species was concerned, before the birds themselves were seen, and then the distinctly orange hue of the forehead and a trace of the same color about the chin and throat revealed the variety. These warblers are among the most confiding of their family, and often come as close to the observer as they can, flitting through the bushes and talking all the while in a conversational tone, although their remarks are restricted to a single syllable. If alarmed they take to the tree-tops in many instances, and there move with such rapidity that it is almost impossible to keep them in sight among the leaves.

128. *Setophaga ruticilla* (Linnaeus)—Redstart.
Redstarts were common in the valley during May, disappearing about the 27th of that month not to reappear until the last week in August, but remaining then at least until the 10th of September. They do not remain to breed in the sandhills but pass through as migrants. Where they are abundant, their song can be heard above the general chorus, so persistently do they give their "su-i'-su-i'-sui'-sui'-sui'-sui' - -."

129. *Dumetella carolinensis* (Linnaeus)—Catbird.
Sometimes during the spring and summer the Catbird's voice was heard from the thickets but the singers were rather retiring and were seen less often than heard. They probably bred in small numbers along the river. On August 25, 1911, I caught one by the foot in a trap which I had set for rodents in the brush by the river, but I think that this capture was entirely accidental.

130. *Toxostoma rufum* (Linnaeus)—Brown Thrasher.
Brown Thrashers were numerous in the river valleys at all times from the earliest to the latest dates that I made observations in the region and are recorded still earlier by F. M. Chapman. On May 19, 1912, there was a single thrasher in the hackberry grove which sheltered

the nests of the Great Blue Herons, several miles back in the depths of the hills. This bird was undoubtedly migrating through this particular situation and probably did not breed there.

131. *Salpinctes obsoletus* (Say)—Rock Wren.

F. M. Chapman found the Rock Wren migrating through Halsey in May, 1906. I failed to find any of the birds during my observations, probably because I reached the locality somewhat too late to catch the earlier spring migrants, among which the present species is to be considered.

132. *Troglodytes aedon parkmani* Audubon—Western House Wren.

The Western House Wren migrates through this region during May and in August and September, although in relatively small numbers. Their bubbling song was a welcome surprise, when I occasionally heard it in the valley thickets, as was also the sight of their little, barred, gray forms whisking through the underbrush or clambering about the shrubbery overhanging the river where they always gave a singularly homelike aspect to the place. The dates which I have for the species are August 31, 1911, and May 17, 18, 20 and 21 and September 6, 1912.

133. *Telmatodytes palustris iliacus* Ridgway—Prairie Marsh Wren.

I saw this marsh wren only on August 28 and 29, 1911, a single bird which was in evidence about a brush heap on a sandbar in the Middle Loup river. The presence of cat-tail swamps and reedy marshes would no doubt favor the presence of this bird in greater abundance than that with which it now occurs here.

134. *Penthestes atricapillus septentrionalis* (Harris)—Long-tailed Chickadee.

From August 22 to September 23, 1911, Long-tailed Chickadees were present sparingly in the Loup valley. R. H. Wolcott recorded their occurrence in July, 1908, and it is possible that the species breeds on the Reserve, although no nests have been found.

135. *Regulus calendula* (Linnaeus)—Ruby-crowned Kinglet.

I noted a Ruby-crowned Kinglet on August 22, 1911, in

the trees along the Middle Loup river. This is a rather early date for the appearance of this bird in Nebraska although it ocurs commonly a week or two later in the more northwestern part of the state.

136. *Myadestes townsendi* (Audubon)—Townsend Solitaire.

Several pairs were noted about the seed-beds, October 27-29, 1910 by M. H. Swenk. "They were industriously catching insects with all the skill of a flycatcher, at intervals giving their peculiar wild call note. According to the men on the Reserve this bird passes through regularly each spring and fall. A specimen was taken on October 27."

137. *Hylocichla mustelina* (Gmelin)—Wood Thrush.

The only record for the Wood Thrush at hand is one made by R. H. Wolcott in July, 1908.

138. *Hylocichla fuscescens salicicola* Ridgway — Willow Thrush.

When I reached Halsey in May, 1912, there were Willow Thrushes present among the trees in the Loup valley and others were found also on May 26 in the valley of the Dismal. May 27 I saw the last one near the Reserve, although a few of the Olive-backed Thrushes, with which the present species was associated, remained about the neighborhood for a few days longer.

These thrushes were exceedingly wary, and would not allow the least approach, but at the first advance in their direction would slip away through the undergrowth and disappear, and it was often difficult to find them again so perfectly did they elude pursuit. Their rather dull plumage was none too conspicuous in the shadows, and the quietness of the wearers did not add to its prominence. The rather brighter coloration of the back of this species served to separate it from the Olive-backed in the field, as did the brighter hue of the breast, although the latter character was less often apparent, owing to the position that the birds usually took with their back toward the observer, watching him over their shoulder and ready to disappear at the slightest provocation.

139. *Hylocichla ustulata swainsoni*—(Tschudi)—Olive-backed Thrush.

Like their companions the Willow Thrushes, these thrushes were shy and retiring. Not once do I remember to have heard them utter a sound of any description. They

were somewhat more numerous than the other species and were seen regularly from May 15 to June 1 in 1912, as well as on August 31 and September 2 in the preceding fa!

140. *Planesticus migratorius* (Linnaeus)—Robin.
The only time I saw the Robin at Halsey was on May 29, 1912. R. H. Wolcott saw it in July, 1908 and on October 27-29, 1910, M. H. Swenk found it abundant about the Reserve. Probably it does not breed in this locality.

141. *Sialia sialis* (Linnaeus)—Bluebird.
The Bluebird is recorded by F. M. Chapman from this locality, and it was noted near the Reserve buildings by M. H. Swenk, October 28, 1910. I failed to find the species present. Like the Robin, the Bluebird is apparently only a migrant at this point.

142. *Sialia currucoides* (Bechstein)—Mountain Bluebird.
On May 26, 1912, as I rode slowly along the valley of the Dismal river, resting my horse after the tiresome succession of hills and hollows which we had crossed since early morning on our way from the Loup river, I saw a lone wanderer in the form of a Mountain Bluebird, perched on a weed stalk some distance ahead of me. It rose at my approach and flew to a position a short distance beyond, displaying as it did so the beautiful coloration of the back, wings and tail, which is so different from the blue of the eastern Bluebird—to my mind much more delicate and more handsome in every particular. This bird repeated its maneuver several times but finally flew to the timber along the river, where I lost sight of it. We must consider the species as a straggler here, although it is common and breeds in the pine-covered region along the western edge of the state.

UNVERIFIED RECORDS.

The following birds have been reported on various occasions by different observers, but the records are not entirely without question, and it has been thought best to list the species separately:

[*Cyanocephalus cyanocephalus* (Weid)—Pinion Jay.
The Pinion Jay has been reported as occurring during migration at the Reserve and may probably be a regular visitor to the region.]

[*Cardinalis cardinalis* (Linnaeus)—Cardinal.

I am informed by men at the Reserve that the Cardinal is present along the Loup in small numbers and winters there.]

[*Mimus polyglottos leucopterus* (Vigors) — Western Mocking Bird.

During the summer of 1912 a pair of mocking birds were reported to me as occurring on the Reserve, a few miles down the river from the station. I was never able to discover the birds, but the occurrence of the species at this point is quite probable, and the variety would undoubtedly be that under which I have placed this note.]

End of Volume V

PROCEEDINGS

OF THE

NEBRASKA ORNITHOLOGISTS' UNION

AT ITS

TWELFTH, THIRTEENTH, FOURTEENTH AND FIFTEENTH ANNUAL MEETINGS

Lincoln, Nebr., May 5 and 6, 1911
Lincoln, Nebr., May 10 and 11, 1912
Lincoln, Nebr., May 9 and 10, 1913
Lincoln, Nebr., May 15 and 16, 1914

EDITED BY
MYRON H. SWENK

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PROCEEDINGS OF THE

NEBRASKA ORNITHOLOGISTS' UNION

OFFICERS

1910-11. President.....L. Sessions, Norfolk
Vice-President.....Mrs. A. E. Sheldon, Lincoln
Secretary-Treasurer.....Myron H. Swenk, Lincoln

1911-12. President.....H. B. Lowry, Lincoln
Vice-President.....Mrs. Lowrie Childs, South Omaha
Secretry-Treasurer.....Myron H. Swenk, Lincoln

1912-13. President.....D. C. Hilton, Lincoln
Vice-President.....Miss Edith Tobitt, Omaha
Secretary-Treasurer.....J. T. Zimmer, Lincoln

1913-14. President.....Lawrence Bruner, Lincoln
Vice-President.....Miss Joy Higgins, Omaha
Secretary-Treasurer.....J. T. Zimmer, Lincoln

ABSTRACT OF MINUTES

TWELFTH ANNUAL MEETING

The twelfth annual meeting of the Nebraska Ornithologists' Union was held at Lincoln, Nebraska, Friday and Saturday, May 5 and 6, 1911. The members of the Union assembled in the banquet room of the Lindell Hotel, Thirteenth and M Streets, at 7:00 Friday evening, where a six-course dinner was served. Immediately after the dinner, at 8:30, President Sessions called

the meeting to order. Fifteen members were present, Messrs. Duncanson, Eiche, Hilton, Horsky, Lowry, Pinneo, Sessions, Shoemaker, Swenk, Tout, Towne, Wolcott and Zimmer, and Misses Higgins, VanSant and Wood. Three candidates for membership and six guests of members of the Union were also present.

After the call to order the President reported briefly for himself and called for the report of the Vice-President. In her absence extracts from a letter from her, regretting the necessity for her absence and wishing the Union a successful meeting were read by the Secretary-Treasurer, who then proceeded to report upon the activities of his own office. A statement of the financial condition of the Union was rendered and the status of the membership explained, while as Editor and Custodian the publications and property of the Union were reported upon in detail. President Sessions appointed Messrs. Wolcott, Eiche and Zimmer an Auditing Committee to examnie the financial statement and report back their findings. R. H. Wolcott then reported briefly for the Record Committee and Wilson Tout for the Educational Committee, both being chairmen of their respective committees. The latter report was detailed and showed clearly the activities of the Educational Committee and the successful results of its work.

The proposal of new names for membership in the Union was next taken up and the names of Mr. R. W. Dawson of Lincoln, and Miss Maud Shipherd of Omaha were proposed. Miss Isaacson also asked for reinstatement, following resignation of 1908. All were voted upon favorably, and declared members of the Society. On motion of the Secretary-Treasurer a Resolutions Committee was appointed to prepare resolutions relative to the loss to the Society by the death of Miss Agnes M. Dawson of Omaha, these to be entered into the Proceedings of the Union and copies sent to the family of the deceased. Misses Wood and Higgins and S. R. Towne were appointed upon this committee. Upon motion of R. H. Wolcott, the Secretary-Treasurer was directed to send a telegram of greetings to Prof. Lawrence Bruner, who was out of the state and thereby forced to be

absent from the meeting, the first he had missed since the organization of the Union. A motion was also unanimously passed extending the thanks of the Union to Mr. Eiche for the splendid table decorations of cut flowers which had been furnished by him.

The election of officers for 1911-12 was then taken up, the ballot resulting as follows:

President, H. B. Lowry, Lincoln.

Vice-President, Mrs. Lowrie Childs, South Omaha.

Secretary-Treasurer, Myron H. Swenk, Lincoln.

The President then appointed a committee to escort the newly-elected President to the chair. This was done amid applause and the President-elect responded gracefully with a speech. The arrangements for the Ninth Annual Field Day were then discussed and a detailed plan agreed upon. R. H. Wolcott for the Auditing Committee stated that it had gone over the financial statement of the Secretary-Treasurer and found it to be correct and moved the acceptance of the report. The motion was carried.

The remainder of the evening was given over to informal talks and discussions, R. H. Wolcott acting as toastmaster. Mr. Duncanson described some interesting observations he had made upon the feeding habits of the White Pelican. Mr. Zimmer explained the status of our Nebraska Juncos and illustrated his remarks with specimens. Mr. Sessions spoke entertainingly on the changes in the bird life about Norfolk during the past forty years. Other remarks and discussions were made upon various ornithological topics by Messrs. Eiche, Tout, Swenk, Towne and Wolcott and Misses VanSant and Wood. At 10:45 P. M. the meeting adjourned.

MYRON H. SWENK, *Secretary-Treasurer.*

NINTH ANNUAL FIELD DAY.—The field party of the N. O. U. left the Government Square, Tenth and O Streets at 7:00 A. M. Saturday, May 6, 1911, and proceeded in a body to the north shore of the lake west of Lincoln (Capital Beach), investigating the outlying salt flats on the way. The northern and eastern shores of the lake were then followed. Return was made to Lincoln at noon. At 12:30 P. M. the train was taken to Roca, twelve miles south of Lincoln, and the afternoon given

over to a study of the woodland birds, the party returning to Lincoln at 5:45 P. M. The composite list of the day included one hundred and three species, only one less than the record list of May 9, 1903. The list follows:

Bluebird, Robin, Wood Thrush, Long-tailed Chickadee, White-breasted Nuthatch, Long-billed Marsh Wren, Western House Wren, Brown Thrasher, Catbird, Maryland Yellowthroat, Louisiana Water-Thrush, Grinnell Water-Thrush, Black-poll Warbler, Myrtle Warbler, Yellow Warbler, Black-and-White Warbler, Yellow-throated Vireo, Warbling Vireo, Red-eyed Vireo, Rough-winged Swallow, Bank Swallow, Tree Swallow, Barn Swallow, Cliff Swallow, Purple Martin, Dickcissel, Rose-breasted Grosbeak, Cardinal, Arctic Towhee, Towhee, Lincoln Sparrow, Song Sparrow, Western Field Sparrow, Clay-colored Sparrow, Chipping Sparrow, White-throated Sparrow, White-crowned Sparrow, Harris Sparrow, Lark Sparrow, Leconte Sparrow, Western Grasshopper Sparrow, Savanna Sparrow, Pine Siskin, Goldfinch, Red Crossbill, Bronzed Grackle, Baltimore Oriole, Western Meadowlark, Red-winged Blackbird, Yellow-headed Blackbird, Cowbird, Crow, Blue Jay, Prairie Horned Lark, Least Flycatcher, Phoebe, Great-crested Flycatcher, Kingbird, Arkansas Kingbird, Chimney Swift, Red-shafted Flicker, Northern Flicker, Red-headed Woodpecker, Downy Woodpecker, Hairy Woodpecker, Belted Kingfisher, Screech Owl, Barred Owl, Short-eared Owl, Red-tailed Hawk, Cooper Hawk, Sharp-shinned Hawk, Mourning Dove, Bobwhite, Piping Plover, Semipalmated Plover, Killdeer, Golden Plover, Spotted Sandpiper, Solitary Sandpiper, Yellow-legs, Greater Yellow-legs, Hudsonian Godwit, Semipalmated Sandpiper, Red-backed Sandpiper, Least Sandpiper, Baird Sandpiper, White-rumped Sandpiper, Pectoral Sandpiper, Long-billed Dowitcher, Wilson Phalarope, Coot, Hutchins Goose, Ruddy Duck, Ring-necked Duck, Lesser Bluebill, Pintail, Shoveller, Blue-winged Teal, Gadwall, Franklin Gull, Ring-billed Gull, Eared Grebe.

A nest of the Pine Siskin, a bird not previously known to nest in Nebraska, was found during the day; nests of the Robin, Western Meadowlark, Screech Owl and Crow were also found by the field party.

THIRTEENTH ANNUAL MEETING

The thirteenth annual meeting of the Nebraska Ornithologists' Union was held at Lincoln, Nebraska, Friday evening, May 10, 1912. At 7:00 P. M. the members sat down to a banquet in the Lindell Hotel. Following the banquet President H. B. Lowry called the meeting to order. Thirteen members were present, Messrs. Bruner, Dawson, Eiche, French, Hilton, Lowry, Shoemaker, Stephens, Swenk, Wolcott and Zimmer and Misses Barbour and Higgins. Three guests of members of the Union were also present.

The minutes of the twelfth annual meeting were read, and, on motion, approved. The President reported briefly for himself and called for the report of the Secretary-Treasurer. This officer presented the usual financial statement and gave an account of the membership and general status of the affairs of the Society. President Lowry appointed R. H. Wolcott and Miss Joy Higgins an Auditing Committee to examine the financial report of the Secretary-Treasurer, and Messrs. Swenk, Shoemaker and Eiche as a Nominating Committee.

R. H. Wolcott reported for the Record Committee. The name of Mr. Chas. S. Ludlow of Red Cloud was proposed for membership and on motion of the Secretary-Treasurer was duly elected.

In order to give the committees an opportunity to work, the order of business was changed somewhat and the first paper of the program was taken up. Mr. J. T. Zimmer gave a very clear account of the relationship, variation and distribution of the White-crowned and Intermediate Sparrows in Nebraska. At the close of Mr. Zimmer's paper the Nominating Committee reported the following nominations for officers during the next year, 1912:

President, Dr. D. C. Hilton, Lincoln.

Vice-President, Miss Edith Tobitt, Omaha.

Secretary-Treasurer, Mr. J. T. Zimmer, Lincoln.

Upon motion of R. H. Wolcott the Secretary was instructed to cast the unanimous ballot of the Society for these officers. The Auditing Committee through R. H. Wolcott reported the financial statement of the Secretary-Treasurer to be correct and moved its acceptance. Carried.

The program was then resumed. T. C. Stephens briefly discussed the woodpeckers of northeastern Nebraska. R. H. Wolcott summarized the ornithological results of the summer of 1911 which was spent in the field in western Nebraska, in Sioux, Banner, Thomas and Cherry counties. F. H. Shoemaker gave a very interesting account of the nesting of the Poorwill and White-throated Rock Swift in western Nebraska during the past summer. The Secretary-Treasurer read excerpts from letters from various members who were prevented from being present, expressing their good wishes for the success of the meeting, and reporting various bird observations of the year.

The President then appointed Messrs. Wolcott and Eiche as a committee to escort the newly-elected President to the chair. Under the head of new business a project of keeping co-operative migration notes was discussed by R. H. Wolcott and T. C. Stephens. The Secretary was instructed to ask the members as to their willingness to serve as a committee to arrange and consolidate migration data. The arrangements for the field day were discussed and decided upon. The meeting then adjourned at 10:30 P. M.

MYRON H. SWENK, *Secretary-Treasurer.*

TENTH ANNUAL FIELD DAY.—Saturday,, May 11, 1912, was exceedingly cold and rainy, so that it was decided not to attempt to hold the usual Field Day with the birds. Instead the party spent the day studying the mounted bird collection belonging to August Eiche.

FOURTEENTH ANNUAL MEETING

The fourteenth annual meeting of the Nebraska Ornithologists' Union was held at Lincoln, Nebraska, Friday evening, May 9, 1913. The members gathered at the Lindell Hotel, where, at 7:00 P. M., they sat down to a banquet. Eleven members were present, Messrs. Bruner, Dawson, Eiche, Hilton, Lowry, Shoemaker, Swenk, Tout, Wolcott and Zimmer and Miss Higgins

Three guests of the Society, Mrs. and Miss Hilton and Miss Bruner, and one candidate for membership, Mr. Gates, were also present.

Following the banquet, President Hilton called the meeting to order. No reports were given by the President or Vice-President. Mr. J. T. Zimmer reported for the office of Secretary-Treasurer, the report being approved and the financial statement referred to an Auditing and Nominating Committee appointed by the chair and consisting of Messrs. Lowry, Eiche and Bruner, the committee to examine the accounts and report on their findings. M. H. Swenk reported for the office of Editor and the report was accepted. Wilson Tout gave a brief report for the Educational Committee and R. H. Wolcott for the Record Committee, both reports being accepted as read.

Election of new members was held, and the names of Messrs. L. M. Gates of University Place, and W. A. Luke and W. R. Skinner of Lincoln were proposed and all were unanimously elected.

H. B. Lowry as chairman of the Auditing Committee reported finding the financial statement of the Secretary-Treasurer correct, and on motion to that effect the report was accepted. As chairman of the Nominating Committee Dr. Lowry presented the following list of candidates for offices for the ensuing year:

President, Professor Lawrence Bruner, Lincoln.

Vice-President, Miss Joy Higgins, Omaha.

Secretary-Treasurer, Mr. J. T. Zimmer, Lincoln.

In presenting the name of the candidate for President it was stated that Professor Bruner was the first President of the Society at its organization and although no other President of the Society had ever held that office twice, it was thought eminently proper and fitting to elect Professor Bruner again, since next year would be the fifteenth anniversary of the Union. H. B Lowry moved to suspend the rules and have the President cast the unanimous ballot of the Society for Professor Bruner as President. M. H. Swenk repeated the motion with reference to Miss Higgins as Vice-Presidest and R. H. Wolcott with reference to J. T. Zimmer as Secretary-Treasurer. These motions

were all seconded and carried and the unanimous ballot of the Society was cast for these officers.

Plans for the field day on Saturday, May 10, were next taken up. It was decided to have one party assemble at Ninth and O Sts. at 7:00 A. M. to start for Capital Beach, a second party to assemble and leave for the same place at 8:00 A. M., later plans to be formulated there for the afternoon trip

Messrs. H. B. Lowry and R. H. Wolcott were appointed a committee to escort the President-elect to the chair, where after the applause had subsided he gave a few words of acceptance.

The Secretary-Treasurer read the minutes of the last meeting, which were then approved, on motion to that effect.

Retiring President Hilton gave a very interesting paper consisting of some "Notes on the Birds of the Gulf Strip of Texas," in which the treated very clearly of a large number of species which he had observed in the region mentioned on several trips to Texas.

After the conclusion of Dr. Hilton's paper, new business was taken up. The matter of the Feather Proviso in "Schedule N" of the Tariff Act, then before Congress, was discussed. On motion to that effect, a committee composed of M. H Swenk and the Secretary was empowered to draft resolutions expressing approval of the portion in question of the Tariff Act, copies of the resolution to be forwarded to the Nebraska Senators and Representatives at Washington. On second motion, Miss Higgins was added to the personnel of the committee.

The matter of a biological survey of Nebraska was brought up and discussed. It was moved, seconded and carried that the Secretary be empowered to express to the Bureau of Biological Survey at Washington, the willingness of the Nebraska Ornithologists' Union to co-operate with the Bureau in getting out such a survey.

The committee on resolutions concerning the Tariff Act proviso reported the following resolution:

"Resolved, that the Nebraska Ornithologists' Union, assembled at the Fourteenth Annual Meeting at Lincoln, May 9, 1913, express their unqualified approval of the Feather Proviso in "Schedule N." of the Tariff

Act, and urge upon the Senators and Representatives of the State of Nebraska to give this provision of the Tariff Act their support.

(Signed) "M. H. Swenk,
"Joy Higgins,
"John T. Zimmer,
"Committee."

The resolution was adopted by the society.

The next question to be taken up was that of the non-issuance of scientific permits for collecting specimens this year, Governor Morehead having refused to issue such permits owing to past abuse of the privilege by non-scientific collectors. A motion was carried to the effect that a committee composed of Messrs. Bruner, Eiche and Wolcott be appointed to confer with the governor regarding the issuance of a limited number of permits to authorized parties connected with scientific institutions.

At 10:00 p. m. the motion was put to adjourn.

John T. Zimmer, *Secretary-Treasurer.*

Eleventh Annual Field Day.—Saturday, May 10, was rainy and stormy and only a few members made the field trip to Capital Beach. In the afternoon, some members visited Wyuka cemetery where several woodland birds, not seen in the morning, were added to the list. Numerous species usually common were not in evidence, but notwithstanding this fact and the inclement weather, a total of ninety-one species was secured. The composite list is as follows:

Robin, Olive-backed Thrush, Gray-cheeked Thrush, Willow Thrush, Wood Thrush, Ruby-crowned Kinglet, Long-tailed Chickadee, Western House Wren, Brown Thrasher, Catbird, Pipit, Redstart, Maryland Yellowthroat, Louisiana Water-Thrush, Grinnell Water-Thrush, Ovenbird, Black-throated Green Warbler, Black-poll Warbler, Magnolia Warbler, Myrtle Warbler, Yellow Warbler, Tennessee Warbler, Orange-crowned Warbler, Black-and-White Warbler, Bell Vireo, Blue-headed Vireo, Warbling Vireo, Rough-winged Swallow, Bank Swallow, Tree Swallow, Barn Swallow, Cliff Swallow, Dickcissel, Rose-breasted Grosbeak, Cardinal, Towhee, Lincoln Sparrow, Song Sparrow, Clay-colored Sparrow, Chipping Sparrow, White-crowned Spar-

row, Intermediate Sparrow, Harris Sparrow, Leconte Sparrow, Western Grasshopper Sparrow, Savanna Sparrow, Goldfinch, Bronzed Grackle, Baltimore Oriole, Orchard Oriole, Western Meadowlark, Red-winged Blackbird, Yellow-headed Blackbird, Cowbird, Crow, Blue Jay, Least Flycatcher, Traill Flycatcher, Kingbird, Chimney Swift, Northern Flicker, Red-headed Woodpecker, Downy Woodpecker, Yellow-billed Cuckoo, Sparrow Hawk, Mourning Dove, Bobwhite, Semipalmated Plover, Killdeer, Spotted Sandpiper, Western Willet, Solitary Sandpiper, Yellow-legs, Greater Yellow-legs, Hudsonian Godwit, Semipalmated Sandpiper, Least Sandpiper, Baird Sandpiper, White-rumped Sandpiper, Pectoral Sandpiper, Coot, Ruddy Duck, Lesser Bluebill, Pintail, Shoveller, Blue-winged Teal, Mallard, Red-breasted Merganser, Black Tern, Franklin Gull, Ring-billed Gull.

FIFTEENTH ANNUAL MEETING

The fifteenth annual meeting of the Nebraska Ornithologists' Union was held at Lincoln, Nebraska, Friday evening, May 15, 1914. At 7:00 P. M. the members met in the ordinary of the Lincoln Hotel. Ten members were present, Messrs. Bruner, Dawson, Eiche, Gates, Hilton, Lowry, Shoemaker, Swenk and Wolcott and Mrs. A. E. Sheldon. Six guests of the Society, Mrs. and Miss Hilton, Mr. and Mrs. Loveland and Mr. Childs of Lincoln, and Miss Laura Evans of Blue Springs, were also present.

After the banquet the Society was called to order with President Bruner in the chair. The minutes of the fourteenth annual meeting were read by the acting Secretary, and on motion by R. H. Wolcott they were approved and accepted. After briefly reporting for his office, in the absence of the Vice-President the report of the Treasurer was next called for and read, and on motion by H. B. Lowry an Auditing Committee yas appointed. Messrs. Eiche, Dawson and Shoemaker were appointed as the Auditing Committee. At the same time a Nominating Commit-

tee, consisting of Messrs. Lowry and Swenk, was appointed by the chair.

R. H. Wolcott reported briefly for the Record Committee. In the absence of the chairman of the Educational Committee no report of this work was received.

Election of new members being in order, the names of Miss Laura Evans of Blue Springs and Mrs. Catherine Foley of Gothenburg were proposed by R. H. Wolcott and S. R. Towne, respectively, and duly elected to membership. On her personal request, Mrs. G. A. Loveland, who joined the N. O. U. in 1901 but resigned in 1904, was reinstated by an affirmative expression of the Society.

August Eiche reported for the Auditing Committee that the reports of the Treasurer for 1913-14 had been examined and found correct, and, on his motion, the report was accepted. H. B. Lowry read the report of the Nominating Committee for officers for 1914-15, as follows:

President, Prof. T. C. Stephens, Sioux City.
Vice-President, Mrs. G. A. Loveland, Lincoln.
Secretary-Treasurer, Mr. R. W. Dawson, Lincoln.

Upon motion of H. B. Lowry that the rules be suspended and that the Secretary be instructed to cast the unanimous ballot of the Society for T. C. Stephens as President, the motion was put and unanimously carried. The motion was repeated for Mrs Loveland as Vice-President by Mrs. Sheldon, and for R. W. Dawson as Secretary-Treasurer by M. H. Swenk, and in each case the nominee was unanimously elected.

New business being in order, the Secretary-Treasurer proposed the following three amendments to the constitution: (1) That in Article II, Section 1, the words "or adjacent states" be inserted after "Nebraska," and (2) that in Article V, Section 4, the words "and to nominate three persons for each of the several offices that are to be filled annually" be stricken out, and (3) that in Article VI, Section 1, the words "and the Secretary-Treasurer shall send a list of the nominees of the Executive Committee to each member one month before the date of the annual meeting" be stricken out. After explanations by the Secretary-Treas-

urer these amendments to the constitution were unanimously carried on motions by H. B. Lowry and August Eiche.

No further new business being proposed, the program was taken up. Retiring President Bruner gave a very instructive address on "A Comparison of the Bird Faunas of the Pampas of Argentina and the Plains of Nebraska," a subject with which he was especially competent to deal because of his extensive travels in Argentina in 1897 and his long expereince with the birds of our plains.

Following the President's address, the Secretary read a highly entertaining letter from Mr. J. T. Zimmer, a member of the Society now engaged in scientific work near Manila, P. I., giving his impressions of Philippine birds. R. H. Wolcott then exhibited a remarkable specimen, obviously the abdominal fat layer of a duck turned to soap, which had recently been found floating on a Cherry county lake by a ranchman. This specimen, though showing plainly the feather tracts, etc., of the bird is simply two-thirds calcium soap, and its formation is attributed by Dr. Wolcott to the bird dying or falling into the lake during a warm period when the fat rapidly united with the alkali of the water to form the soap. M. H. Swenk then exhibited a series of Nebraska nighthawks, and explained the distribution of the various subspecies in this state, so far as it is at present understood.

Plans for the Twelfth Annual Field Day were then taken up and discussed, and it was decided to visit the beach west of Lincoln in the morning, leaving the city on the electric cars in two parties, at 5:00 A. M. and 6:40 A. M., respectively, and to spend the afternoon on the Salt Creek bluffs near Havelock, leaving the city at 1:20 P. M.

At 10:30 the meeting adjourned.

MYRON H. SWENK, *Acting Secretary-Treasurer.*

TWELFTH ANNUAL FIELD DAY.—On Saturday, May 16, the field party of the N. O. U. visited Capital Beach from early morning until noon, and in the afternoon, from 2:00 to 6:00 P. M., the birds seen on the trip to the "Havelock Bluff" northeast of Lincoln were listed. The composite list for the day was rather small,

owing to the fact that the migration was largely over. Eighty-five species were observed, as follows:

Bluebird, Robin, Wood Thrush, Long-tailed Chickadee, Western House Wren, Brown Thrasher, Catbird, Maryland Yellow-throat, Ovenbird, Black-poll Warbler, Yellow Warbler, Orange-crowned Warbler, Bell Vireo, Warbling Vireo, Red-eyed Vireo, Migrant Shrike, Rough-winged Swallow, Bank Swallow, Barn Swallow, Purple Martin, Dickcissel, Indigo Bunting, Rose-breasted Grosbeak, Cardinal, Towhee, Lincoln Sparrow, Clay-colored Sparrow, Chipping Sparrow, Harris Sparrow, Lark Sparrow, Western Grasshopper Sparrow, Savanna Sparrow, Pine Siskin, Goldfinch, Bronzed Grackle, Baltimore Oriole, Orchard Oriole, Western Meadowlark, Red-winged Blackbird, Cowbird, Blue Jay, Prairie Horned Lark, Phoebe, Great-crested Flycatcher, Kingbird, Chimney Swift, Northern Flicker, Red-headed Woodpecker, Downy Woodpecker, Hairy Woodpecker, Belted Kingfisher, Yellow-billed Cuckoo, Swainson Hawk, Sharp-shinned Hawk, Marsh Hawk, Mourning Dove, Bobwhite, Turnstone, Piping Plover, Semipalmated Plover, Killdeer, Black-bellied Plover, Spotted Sandpiper, Yellow-legs, Semipalmated Sandpiper, Least Sandpiper, Baird Sandpiper, White-rumped Sandpiper, Stilt Sandpiper, Wilson Phalarope, Coot, Black-crowned Night Heron, Green Heron, Ruddy Duck, Lesser Bluebill, Redhead, Shoveller, Blue-winged Teal, Green-winged Teal, Gadwall, Mallard, Black Tern, Franklin Gull, Eared Grebe.

Report of Treasurer, 1910-1911

Receipts

Cash received from previous Treasurer, April 30, 1910		$ 53.78
1	Annual dues for 1905—Active	2.00
2	Annual dues for 1906—Active	4.00
2	Annual dues for 1907	4.00
2	Annual dues for 1908	4.00
6	Annual dues for 1909	12.00
18	Annual dues for 1910	36.00

1 Annual dues for 1911	2.00
Sale of Proceedings and Checklists	3.75
	$121.53

EXPENDITURES

Jacob North & Co., printing Vol. V, Part 1 and 500 receipts	$ 31.45
McVey Printing Co., printing Vol. V, Part 2	16.20
McVey Printing Co., printing Vol. V, Part 3	13.30
McVey Printing Co., printing 1,000 letter heads for use of Secretary-Treasurer	3.50
Postage, office of Secretary-Treasurer	1.45
Stenography, office of Secretary-Treasurer	2.20
Balance on hand, May 5, 1911	53.43
	$121.53

Respectfully submitted,
MYRON H. SWENK, *Secretary-Treasurer.*

REPORT OF TREASURER, 1911-12

RECEIPTS

Cash on hand, May 5, 1911	$ 53.43
2 Annual dues for 1906—Active	4.00
2 Annual dues for 1907	4.00
3 Annual dues for 1908	6.00
5 Annual dues for 1909	10.00
10 Annual dues for 1910	20.00
14 Annual dues for 1911	28.00
3 Annual dues for 1912	6.00
Sale of Proceedings	2.10
	$133.53

EXPENDITURES

Boyd Printing Co., printing Vol. V, Part 4	$ 18.20
State Journal Co., mkaing two halftones for Vol. V, Part 4	3.60
Postage, office of Secretary-Treasurer	2.90

Telegram	.50
Return of balance from banquet of May 14, 1909	1.00
Balance on hand, May 10, 1912	107.33
	$133.53

Respectfully submitted,
MYRON H. SWENK, *Secretary-Treasurer.*

REPORT OF TREASURER, 1912-13

RECEIPTS

Cash received from previous Treasurer, May 10, 1912	$107.33
2 Annual dues for 1909	4.00
3 Annual dues for 1910	6.00
11 Annual dues for 1911	22.00
14 Annual dues for 1912	28.00
Sale of Checklists	.20
Excess on banquet fund	1.50
	$169.03

EXPENDITURES

Boyd Printing Co., printing Vol. V, Part 5	$ 88.45
Postage, office of Secretary-Treasurer	2.00
Balance on hand, May 9, 1913	78.58
	$169.03

Respectfully submitted,
JOHN T. ZIMMER, *Secretary-Treasurer.*

REPORT OF TREASURER, 1913-14

RECEIPTS

Cash on hand, May 9, 1913	$ 78.58
1 Annual dues for 1911	2.00
3 Annual dues for 1912	6.00
4 Annual dues for 1913	8.00

1 Annual dues for 1914	2.00
Sale of Proceedings	5.95
Sale of Checklists	.25
	$102.78

EXPENDITURES

Postage, office of Secretary-Treasurer	$ 1 90
Materials for preserving N. O. U. collections	.30
Balance on hand, May 15, 1914	100.58
	$102.78

Respectfully submitted,

JOHN T. ZIMMER, *Secretary-Treasurer.*

MYRON H. SWENK, *Acting Secretary-Treasurer.*

CONSTITUTION AND BY-LAWS

ARTICLE I

Name and Object

Section 1. This Association shall be known as The Nebraska Ornithologists' Union.

Sec. 2. Its aims shall be to promote the study of ornithology by more closely uniting the students of this branch of natural history, and to encourage the study of birds in the state of Nebraska.

ARTICLE II

Members

Section 1. Any student of ornithology resident in Nebraska or adjacent states, not less than sixteen years of age, may become a member on receiving a majority vote of the members present at any meeting. All members in good standing shall have the right to vote and hold office.

Sec. 2. Honorary members shall be elected for their eminence in ornithology or for distinguished services in furthering the aims for which this Union is established.

Sec. 3. Application for membership in the interim between meetings may be considered by the Executive Committee, and the application granted by a unanimous vote of the committee.

ARTICLE III

Quorum

Section 1. A quorum for the transaction of business shall be the active members present at any annual meeting, provided the number is not less than nine.

ARTICLE IV

Officers and Committees

Section 1. The officers of this Union shall be: a President, a Vice-President and a Secretary-Treasurer.

Sec. 2. There shall be an Executive Committee consisting of the officers.

Sec. 3. Standing committee shall be appointed by the President with the concurrence of the Executive Committee.

ARTICLE V

Duties of Officers and Committees

Section 1. Duties of the President—It shall be the duty of the President to preside at all the meetings of the Union, to appoint the standing committees, and to perform such other duties as may properly pertain to the office.

Sec. 2. Duties of the Vice-President.—It shall be the duty of the Vice-President to act in the absence or incapacity of the President.

Sec. 3. Duties of the Secretary-Treasurer.—It shall be the duty of the Secretary-Treasurer to keep a record of all the meetings of the Union, to countersign all orders and documents issued by the President, to conduct the general correspondence of the Union, to prepare the program of the meetings, to send out the call for such meetings, to superintend the publication of the Proceedings of the Union, to have charge of all property of the Union, to receive and have charge of all moneys of the Union and to pay such bills as are endorsed by the President and to perform such other duties as properly pertain to this office.

Sec. 4. Duties of the Executive Committee. It shall be the duty of the Executive Committee to fix the date and place of the annual meeting, to act on applications for membership as provided in Article II, section 3, to concur in the appointment of standing committees as provided in Article IV, section 3, and to fill by temporary appointment offices which shall become vacant.

ARTICLE VI

Election of Officers and Committees

Section 1. The election of all officers shall be by ballot, a majority of those voting being required to elect.

Sec. 2. The term of office shall extend from the end of one annual meeting to the end of the next one.

ARTICLE VII

Meetings

Section 1. The annual meeting of the Union shall be held at such place and time as the Executive Committee shall decide.

ARTICLE VIII

Dues and Assessments

Section 1. The annual dues of the members shall be two dollars ($2), due at the time of election to membership and on the date of each annual meeting thereafter.

Sec. 2. In case of failure to pay dues before the close of the year, a member shall forfeit his right to the publications of the Union.

Sec. 3. In case of failure to pay dues for two years a member shall be dropped from the roll of the Union.

ARTICLE IX

Amendments

Section 1. An amendment to this constitution may be adopted by an affirmative vote of two-thirds of the members present at any annual meeting, one month notice of the proposed amendment having been given all members.

BY-LAWS

Section 1. The actual amount expended by the officers in carrying on their official duties shall be refunded to them.

Sec. 2. All members in good standing shall receive gratis one copy of the publications of the Union. Other copies of the publications may be distributed under sanction of the Executive Committee.

Sec. 3. All papers presented at the meetings shall be the property of the Union and shall be filed with the Secretary-Treasurer.

Sec. 4. The order of business at the annual meeting shall be as follows: 1, Reports of Officers; 2, Reports of Committees; 3, Proposal of Names and Election of Members; 4, New Business; 5, Announcement of Election of Officers and Committees; 6, Presentation and Discussion of Papers and Remarks; 7, Installation of Officers; 8, Reading of Minutes; 9, Adjournment.

Sec. 5. Application for membership must be made to the Executive Committee, and such application must have the indorsement of at least one member in good standing, which shall be expected to be a proper recommendation of the candidate.

Sec. 6. Any of the By-Laws may be amended or repealed by vote of a majority of the members.

LIST OF MEMBERS

Corrected to January 1, 1915. Names of Charter Members indicated by an asterisk.

MEMBERS

*Bates, Rev. J. M., Red Cloud.....1900
Bruner, H. F., Kola.....1901
*Bruner, Prof. Lawrence, University Farm, Lincoln.....1900
Dawson, R. W., University Farm, Lincoln.....1911
Duncanson, H. B., Peru.....1901
*Eiche, August, 1133 O St., Lincoln.....1900
Evans, Miss Laura, Blue Springs.....1914
Foley, Mrs. Catherine, Gothenburg.....1914
Gates, L. M., University Farm, Lincoln.....1913
Higgins, Miss Joy, 527 Park Avenue, Omaha.....1908
Hilton, Dr. D. C., 1238 O St., Lincoln.....1909
Horsky, L. O., Mailing Division, Post Office, Omaha.....1910
Loveland, Mrs. G. A., Lincoln.....1901
Lowry, Dr. H. B., 843 S. 10th St., Lincoln.....1901
Ludlow, C. S., Red Cloud.....1912
Luke, W. A., Secretary City Y. M. C. A., Lincoln.....1913
McDonald, Miss Jeanette, 318 So. 26th St., Omaha.....1905
Payne, Mrs. Geo. H., West Dodge St., Omaha.....1901
Pollard, Hon. Isaac, Nehawka.....1903
Salter, G. B., Norfolk.....1908
*Sessions, L., Norfolk.....1900
Sheldon, Mrs. A. E., 1319 So. 23d St., Lincoln.....1904
Shipherd, Miss Maude, 4811 Davenport St., Omaha.....1911
Stephens, Prof. T. C., Morningside College, Sioux City, Ia..1911
Skinner, W. R., 3161 Kleckner Court, Lincoln.....1913
*Swenk, Prof. M. H., University Farm, Lincoln.....1900
Tobitt, Miss Edith, Omaha Public Library, Omaha.....1907
*Tout, Wilson, Supt. Schools, North Platte.....1900
*VanSant, Miss Elizabeth, 2960 Dewey Avenue, Omaha....1900
*Wolcott, Dr. R. H., University of Nebraska, Department of Zoology, Lincoln 1900
Zimmer, J. T., Department of Agriculture, P. I.....1907

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PROCEEDINGS OF THE

NEBRASKA ORNITHOLOGISTS' UNION

THE ESKIMO CURLEW AND ITS DISAPPEARANCE

BY MYRON H. SWENK

It is now the consensus of opinion of all informed ornithologists that the Eskimo Curlew *(Numenius borealis)* is at the verge of extinction, and by many the belief is entertained that the few, scattered birds which may still exist will never enable the species to recoup its numbers, but that it is even now practically a bird of the past. And, judging from all analogous cases, it must be confessed that this hopeless belief would seem to be justified, and the history of the Eskimo Curlew, like that of the Passenger Pigeon, may simply be another of those ornithological tragedies enacted during the last half of the nineteenth century, when, because of a wholly unreasonable and uncontrolled slaughter of our North American bird life, several species passed from an abundance manifested by flocks of enormous size to a state of practical or complete annihilation. In this deadly work the people of Nebraska, as well as those of our neighboring states, to our lasting discredit played a conspicuous and all too effective part each spring, while in the fall the equally profligate gunners of New England and the Atlantic states poured leaden death into southbound flocks of these unfortunate birds whenever an opportunity presented itself.

Nothing was known concerning this interesting bird until after the middle of the eighteenth century. It was originally described by Forster[1] in 1772, as *Scolopax borealis,* from a specimen taken

[1]Forster, J. R. Phil. Trans. Royal Soc. London, lxii, pp. 411 and 431, 1772.

at Albany Fort, Hudson Bay. Pennant[2] in 1785 and Hearne[3] in 1795 both erroneously referred to the larger congener of this bird, the Hudsonian Curlew *(Numenius hudsonicus)*, as the "Eskimaux Curlew," though the latter author recognized two species of curlew as abundant about Hudson Bay from 1769 to 1772, the smaller of which was undoubtedly the present species. In 1790 Latham[4] formally described the Hudsonian Curlew and referred the Eskimo Curlew to the same genus, but confusion between the two species continued up to the earlier years of the nineteenth century, and the bird described by Wilson[5] in 1813 as the "Esquimaux Curlew" was in reality the Hudsonian, the species rightfully entitled to the name he used being unknown to him. The Hudsonian Curlew is a large bird, about seventeen inches long, with a bill about four inches long, a whitish stripe in the middle of the top of the head and the long flight feathers of the wing barred with buffy; the Eskimo Curlew is two to five inches shorter, with a bill only slightly over two inches long, the crown unstriped and the flight feathers of the wing unbarred.

In the spring migration this curlew passed through the interior of the United States, in the Mississippi valley, rarely if ever occurring on the Atlantic ocean or its coasts. It first appeared in the United States in Texas and Louisiana during early to middle March. In central Texas Brown[6] noted it at Boerne, Kendall county, March 9, 1880, as a rather common migrant, while in northern Texas at Gainesville, Cooke county, it arrived on the average March 17, according to Ragsdale, while its earliest date was March 7, 1884[7]. In the adjacent county, Wise, it was noted as late as April 2, 1884, while at Caddo, Oklahoma, a short distance across the Red River from Gainesville, in 1884 it was noted March 25 and was abundant on April 2[8]. In Louisiana, where it was a common migrant[9], the last records are for March 17 and

[2]Pennant, T. Arctic Zoology, ii, 1785.
[3]Hearne, S. A journey from Prince of Wales' Fort in Hudson's Bay to the Northern Ocean, 1795.
[4]Latham, J. Index Ornithologicus, ii, p. 712, 1790.
[5]Wilson, A. American Ornithology, vii, 1813.
[6]Brown, N. C Bull. Nuttall Ornith. Club, vii, p. 42, 1882.
[7]Cooke, W. W. Bull. 35, Bureau of Biological Survey, pp. 74-76, 1910.
[8]Cooke, W. W. Bull. 2, Division of Economic Ornithology, p. 98, 1888.
[9]Beyer, G. E., Allison, A., and Kopman, H. H. Auk, xxv, p. 179, 1908.

23, 1889[10], while for Arkansas the last record is from Fayetteville, March 31, 1883, on the authority of Prof. F. L. Harvey[11].

The quadrangle of states to the north—Kansas, Missouri, Iowa, and Nebraska—saw the passing through of these curlews during the last few days in March and during April. By the last of March the vanguard of the birds had reached central Missouri, (St. Louis, March 25, 1884)[8] and southern Nebraska, (Waco, March 31, 1911)[12]. Curlews were on the St. Louis market April 6, 1885[8], a flock of a hundred birds was seen in Vernon county, southwestern Missouri, April 16, 1894, and a flock of ten was noted in the neighboring county of Jasper as late as May 2, 1902[13]. In central Kansas, according to the observations of Kellogg, they reached Emporia April 14, 1884, and April 13, 1885[7 8]. In Iowa, the last recorded specimen was taken at Burlington in the extreme southeastern part of the state, April 5, 1893, by Paul Bartsch[14]. The bulk of the birds reached southern Nebraska about April 2 to 25 and remained until the 15 to 25 of May; in northern Nebraska they were apparently most numerous in early May. The van reached Heron Lake, Jackson county, in south western Minnesota, April 3, 1884, and the next year, 1885, were noted at this place on April 24[8]. In southeastern South Dakota, the bulk arrived at Vermilion, Clay county, May 3, 1884[8], while Coues reported them present in large flocks between Fort Randall and Yankton during the second week in May, 1873[15].

By latter May the curlews had reached their breeding range in the far north, on the Barren Grounds of Mackenzie within the shadow of the Arctic Circle or even within the Circle itself. They reached Fort Resolution, near the south shore of Great Slave Lake, May 26, 1860, Kennicott mentioning in his journal the taking of a specimen there on that date.[16]. At Fort Anderson, Mackenzie, near the Arctic coast, they were noted May 27, 1865, by

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[10]Forbush, E. H. Game Birds, Wildfowl and Shorebirds, pp. 416-432, 1912.
[11]Howell, A. H. Bull. 38, Bureau of Biological Survey, p. 32, 1911.
[12]Eiche, A. *Antea,* v, p. 31, 1911.
[13]Widmann, O. Trans. Acad. Science St. Louis, p. 75, 1907.
[14]Anderson, R. M. Proc. Davenport Acad. Sciences, xi, p. 227, 1907.
[15]Coues, E. Birds of the Northwest, pp. 510-512, 1874.
[16]Biography of Robert Kennicott; Committee, Chicago Acad. Sciences, in: Trans Chicago Acad. Sciences, i, p. 172, 1869.

MacFarlane[17]. In this latter locality the birds bred abundantly, MacFarlane collecting some thirty sets of eggs on the Barren Grounds east of Fort Anderson on June 13, 1863, June 16, 1864, and June 16, 1865[18]. Previously Richardson had found "one of these curlews hatching on three eggs on the short of Point Lake," Mackenzie, on June 13, 1822[19]. He also found these birds at Fort Franklin, on the west short of Great Bear Lake, Mackenzie, late in May, 1849, but this was probably too early for nests[20]. The breeding range probably extended from Alaska to Labrador as these curlews penetrated even as far to the northwest as Point Barrow, at the apex of the north Alaskan coast, where though "rare and irregular" it was first seen by Murdock May 20, 1882, and last seen July 6 of that year, thus probably being present through the breeding season[21]. Also, eastwardly it was recorded by Kumlien as pasing in small flocks northward in June, 1878, at Cumberland Bay, and a specimen was taken[22]. It was not known, however, to have actually nested either west or east of the Mackenzie Barren Grounds.

The nest of the Eskimo Curlew was a mere hole in the ground on the open plain lined with a few decayed leaves with a thin sprinkling of dried grass in the center. The eggs were laid by the third week in June. As the setting bird would glide off before the nest was closely aproached it was a very difficult thing to find. After leaving the nest the female usually soon ascended into the air in a straight line. The eggs, usually four in number, were oblong oval, slightly pear-shaped, varying in size from 1.90x1.40 to 2.12x1.33, and also exceedingly variable in color, a pale green or greenish gray to clay colored or olivaceous drab heavily marked on the larger end with shades of sepia to umber

[17]Preble, North American Fauna, No. 27, p. 332, 1908.
[18]MacFarlane, R. Proc. U. S. Nat. Museum, xiv, p. 429, 1891.
[19]Swainson, W. and Richardson, J. Fauna Boreali-Americana. London. ii, p. 378, 1831.
[20]Richardson, J. Arctic Searching Expedition: A Journal of a Boat-Voyage through Rupert's Land and the Arctic Sea, in search of the Discovery Ships under command of Sir John Franklin, London, ii, p. 108, 1851.
[21]Murdock, J. Auk, ii. p. 63 and p. 201, 1885.
[22]Kumlien, L. Bull. 15, U. S. Nat. Museum, p. 88, 1879.

brown. The young began hatching about July 12, leaving the nest as soon as hatched and hiding away in the grass if alarmed[15 23].

Late in July and early in August the curlews had completed their domestic duties, and began congregating in flocks preparatory for their long southward migration. Their first movement was from the Barren Grounds southeastward to the eastern shores of Labrador, where they massed in immense swarms. July 29, 1833, while Audubon was near the harbor of Bras d'Or, Labrador, he found these curlews coming in from the north in such dense flocks as to remind him of the flights of the Passenger Pigeon[24]. In 1838 Tucker recorded these birds as exceedingly abundant, occurring in vast flocks on the Labrador coast[25]. In 1860 Dr. Packard noted a flock which was perhaps a mile long and nearly as broad, and the sum total of their distant notes resembled the wind whistling through the rigging of a ship, or at times sounding like the jingling of many sleigh bells[10]. Dr. Coues in the same year noted their arrival at Indian Tickle Harbor, Labrador, August 16, 1860[7]. Norton recorded their arrival at Houlton Harbor, Labrador, August 20, 1891[7]. Here they found an abundance of food and gorged themselves until they became extremely fat. During latter August the bulk of the curlews crossed the Gulf of St. Lawrence to Newfoundland and Nova Scotia, and from there struck out to sea, heading toward their South American winter home. The records at Cartwright, Labrador, cover the period from July 28 to October 24[26].

During this long flight, if the weather was fair and fine, little was seen of the curlews from the time they left the Newfoundland and Nova Scotia shores until they reached the Lesser Antilles, nearly 2,000 miles away. A few flocks would land for a few days on the Bermuda Islands, according to Jardine[7], and if southerly storms prevailed great numbers of them would land,

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[23]Baird, S. F., Brewer, T. and Ridgway, R. Water Birds of North America, i. p. 318, 1884.

[24]Audubon, J. J. Birds of America, vi. p. 45, 1843; Orn. Biog., iii. p. 69 and v, p. 590, 1835.

[25]Tucker, E. W. Five months in Labrador and Newfoundland in 1838, p. 110, 1839.

[26]Townsend, C. W. and Allen, G. M. Proc. Boston Soc. Nat. Hist., xxxiii, pp. 356-357, 1906-1907.

but usually the bulk passed on, and, flying both day and night, probably without landing, did not land until the Lesser Antilles had been reached. Passing through these islands, they continued along the eastern portion of Brazil to Argentina, their winter home[7]. Barrows reports them arriving at Conception del Uruguay, in large flocks, Sept. 9, 1880, and remaining until the middle of October. At Bahia Blanca they were seen every day until late in February, but after March they had disappeared[27]. Most of the birds arrived in Argentina about the middle of September and wintered in the campos region of that country, mostly south of Buenos Aires[7]. They occurred south to the Chabut valley, Patagonia, according to Durnford, and according to Abbott a specimen was taken on the Falkland Islands[7]. On the west coast they were rare, but occurred in Chile south to Chiloe[7].

But if easterly storms occurred, the birds would be driven out of their line of flight, and great flocks would occur on the coast of New England, and, less commonly, the shores of the middle and southern states. Or, if westerly storms prevailed, they might be driven far out to sea or even across the Atlantic, as there are several records of the occurrence of the species on the British Isles in the fall. On September 6, 1855, one was recorded from Cairn Moncarn, near Stonehaven, Kincardineshire[28], two others were also taken on unknown dates on the Alde at Aldeburgh, and at Woodbridge, both in Suffolk[29], a fourth was purchased in Dublin, in the flesh, October 21, 1870[30], another individual at Slains, Aberdeenshire, September 28, 1878[31], and a sixth bird, a male, at Forest of Birse, Kincardineshire, September 21, 1880[32]. On May 26, 1906, an Eskimo Curlew came on shipboard about halfway between Ireland and Newfoundland (Lat. 49° 06′ N., Long. 27° 28′ W.) in a fatigued condition[33].

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[27]Barrows, W. B. Auk, i, p. 316, 1884.
[28]Longmuir, Naturalist, p. 265, 1855, and Yarrell, British Birds, ii, p. 620.
[29]Hele, Notes about Aldeburgh, p. 177, and Harting, Handbook of British Birds, p. 145.
[30]Blake Knox, Zoologist, p. 2408, 1870.
[31]Sim, Scottish Naturalist, p. 36, 1879.
[32]Harvie-Brown, Zoologist, p. 485, 1880.
[33]Barbour, R. Auk, xxiii, p. 459, 1906.

On the Pacific coast south of Alaska this bird was always very rare. A lone specimen was shot over decoys at San Diego, California, September, 1883, and was the only one seen[34]. Mr. P. I. Hoagland, who is well acquainted with this bird in Nebraska, states that a number of years ago he saw a flock of about a dozen birds at Coronado Beach, near Tia Juana, California, and that he shot a few birds from this bunch.

In Labrador the Eskimo Curlews were abundant until about 1876, according to observations reported to Townsend and Allen[26], but there was a great and sudden falling off in numbers about 1886. Other observers place the sudden decline in 1891[10] or 1892[35]. Bigelow states that after 1892 the birds appeared no more in numbers, and while in Labrador in September, 1900, he heard of only about a dozen being seen on the coast, and of these he personally saw five[35]. According to Dr. W. T. Grenfell the birds became scarce in the 80's in Labrador, and in 1892 he saw only two flocks of any size. In 1906 he heard of a few dozen being killed, but did not see one[26]. During the years 1908-1911 the birds were not noted in Labrador[10], but in August and September, 1912, eight Eskimo Curlews were seen on the beach at West Bay, north of Cartwright, Labrador, and seven of these were shot, while the skins of five were saved and sent to Cambridge, Massachusetts, by Dr. Grenfell, where they were seen and identified by Mr. William Brewster[36].

During the period of abundance in Labrador these birds were continually and heavily slaughtered. One hunter states that the fishermen killed them by thousands, and he had personally shot a hundred before breakfast[26]. Another hunter, quoted by Carroll[37], said that he did not remember having secured less than thirty or forty brace in a two hours' shoot, and in a day's shooting by twenty-five or thirty men as many as two thousand birds would be killed for the Hudson Bay Company's store at Cartwright.

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[34]Holterhoff, G. Auk, i, p. 393, 1884.
[35]Bigelow, H. B. Auk, xix, p. 29, 1902.
[36]Townsend, C. W. Auk, xxx, p. 10, 1913.
[37]Carroll, W. J. Forest and Stream, lxxiv, p. 372 (1910).

Concerning the shooting in Labrador, Coues[38] says: "The most successful method of obtaining them is to take such a position as they will probably fly over in passing from one feeding ground to another. They may then be shot with ease, as they rarely fly high at such times. The pertinacity with which they cling to certain feeding grounds, even when much molested, I saw strikingly illustrated on one occasion. The tide was rising and about to flood a muddy flat, of perhaps an acre in extent, where their favorite snails were in great quantities. Although six or eight gunners were stationed upon the spot, and kept up a continual round of firing upon the poor birds, they continued to fly distractedly about over our heads, notwithstanding the numbers that every moment fell. They seemed in terror lest they should lose their accustomed fare of snails that day. On another occasion, when the birds had been so harrassed for several hours as to deprive them of all opportunity of feeding, great numbers of them retired to a very small island, or rather a large pile of rocks, a few hundred yards from the shore, covered with sea-weed and, of course, with snails. Flock after flock alighted on it, till it was completely covered with the birds, which there, in perfect safety, obtained their morning meal."

In Newfoundland and on the Magdalen Islands in the Gulf of St. Lawrence, for many years after the middle of the nineteenth century, the Eskimo Curlews arrived in August and September in millions that darkened the sky[39]. As late as 1890 a "cloud" of these birds was seen on the Magdalen Islands, perhaps the last large flocking of these birds that was seen anywhere in the east[40]. In 1900 one was killed on an island in the Gulf of St. Lawrence, in 1901 one was killed on Prince Edward Island, in 1902 it is believed one was taken on Sable Island and in 1906 a male was killed, September 6, on the Madgalen Islands[10]. In Nova Scotia, since 1888, there is but one record of this bird, a specimen in the Halifax market, September 11, 1897[10].

The fishermen of Newfoundland, as well as those of Labrador, made a practice of salting down these birds in barrels. At night when the birds were roosting in large masses on the high beach,

[38] Coues, E. Proc. Philadelphia Acad. Nat. Sciences, p. 236, 1861.

a man armed with a lantern to dazzle and confuse the birds could approach them in the darkness and kill them in enormous numbers by striking them down with a stick[39].

In New England, and especially in Massachusetts, the Eskimo Curlew was known as the "Dough-bird" or "Doe-bird," and the existing accounts would indicate that these birds occurred on Cape Cod, Nantucket and other points on the coast in tremendous numbers in August and September during northeast storms in the early part of the nineteenth century. During these storms the birds sometimes landed in a state of great exhaustion, and they could be chased and easily knocked down with clubs when they attempted to fly. These immense flights continued to appear on the Massachusetts coast up to the middle of the nineteenth century or even later. In the 30's and 40's these birds alighted on Nantucket in such numbers that the shot supply of the island would become exhausted and the slaughter would have to stop until more could be secured from the mainland[40]. By 1858 Sumner[41] wrote for the vicinity of Boston: "None are now to be seen where once they were so abundant, and even the market offers but few at fifty cents apiece." In other less frequented parts of th coast, however, the bird continued common for twenty-five years or more. Up to 1861 there were some birds each year on the Massachusetts coast, but there were none in 1862[42]. A great flight occurred there August 29, 1863. A few days later, on September 3, 1863, on Cape Cod several gunners killed 281 Eskimo Curlew and Golden Plover in one day[39].

A few birds occurred on the Massachusetts coast in 1866, 1867, 1868, 1869 and 1870, but none in 1864, 1865 and 1871[42]. In 1872 there were two flights, and the birds were killed in such numbers that two market gunners sold three hundred dollars' worth and boys offered the birds for sale at six cents apiece[40]. There were some birds in 1873, 1875 and 1876, but none in 1874, while

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[39]Hapgood, W. Forest and Stream series No. 1, Shore Birds, pp. 17 and 22-23, 1885.

[40]Sanford, L. C., Bishop, L. B. and Van Dyke, T. S. The Water-fowl Family, pp. 445-446, 1903.

[41]Sumner, W. H. History of East Boston, p. 53, 1858.

[42]Mackay, G. H. Auk, ix, pp. 16-21, 1892; x, p. 79, 1893; xi, pp. 75-76, 1894; xiv, p. 214, 1897; xv, pp. 52-53, 1898; and xvi, p. 180, 1899.

in 1877 there was a flight and in 1878 a smaller flight[42]. In 1879 there were no birds, but the next three years there were some; in 1882 two hunters on Nantucket shot 87 Eskimo Curlew in one morning, while at about the same time another hunter on Martha's Vineyard killed about 70 of them[10]. In 1883 there was a large flight August 26[42], while on August 30 of that year the last great flight of Eskimo Curlew and Golden Plover occurred on Cape Cod[48]. There were a few birds in 1884, 1885, 1886 and 1887, a number in 1888 and 1889, again a few birds in 1890, 1891 and 1892, while in 1893 a single bird was shot[42] and another seen[44]. One bird was seen in the Boston market in 1894[42], two were killed at Chatham in 1895[10], none were seen in 1896, eight in 1897, and two in 1898[42]. At Chatham Beach one was killed in 1897, four in 1899 and the last one on September 13, 1900[10]. In 1898 one was seen at Dennis, in 1900 one was killed at Eastham[10] and in 1901 birds were killed at Ipswich[44] and on Prince Edward Island[10]. In October, 1902, two were obtained in the Boston market and one of them came from Massachusetts[10]. In 1908 two were shot at Newburyport, Massachusetts, August 27, and one of them was saved[45].

In New York State the Eskimo Curlew was seen or taken every year, except 1888, from 1885 to 1891; the last record for that state being about 1896[46]. In early days there were flights of many thousands of these birds on Long Island, where they were known as "Futes," at long intervals during heavy easterly storms, but not in recent years[47]. In twelve years this bird was met with only four times by N. T. Lawrence, viz.: September 12, 1875, September 10, 1876, and September 26, 1884, two on the latter date[48]. In Maine, a female was shot at Pine Point, September 23, 1901, and two were shot at Hog Island, Hancock County, in September, 1909, one on the 2d and one on the 14th, both specimens being preserved[10 49].

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[42]Job, H. K. Wild Wings, pp. 207-208, 1905.
[44]Townsend, C. W. Birds of Essex County.
[45]Mayer, J. E. Auk, xxvi, p. 77, 1909.
[46]Eaton, E. H. Birds of New York, i, 1910.
[47]Braislin, W. C. Proc. Linnaean Soc. New York, p. 64, 1907.
[48]Lawrence, N. T. Auk, ii, p. 273, 1885.
[49]Knight, O. W. Auk, xxvii, p. 79, 1910.

As to the destruction in Massachusetts, Forbush[49] says: "The decrease of the Dough-birds in Massachusetts during the last century may be explained in part by the continual persecution they suffered here. The arrival of these birds was the signal for every gunner and market hunter on the coast to get to work. The birds were rarely given any rest. Nearly all that remained on our shores were shot, and only those that kept moving had any chance for their lives. As a consequence of this continual persecution, the birds probably learned to avoid the New England coast; and most of those that were driven to land by storms left the moment the weather was favorable for a continuance of their flight. Often they came in at night and went in the morning."

In Texas the Eskimo Curlew came in immense flocks on the prairies from 1856 to 1875, after which year the large flocks disappeared[10]. Small flocks were seen in 1886 and 1890[10]. The last records of the species for Texas were 1902 and 1905, one and three individuals respectively[10]. The species was first definitely recorded for Kansas from Russell county in 1874[50]. In that state these curlews were abundant as late as 1878, but in 1879 their numbers were much reduced and the birds decreased rapidly[10]. There were still a few in the Kansas markets in the early 90's. The last record is for 1902[10].

Eastwardly in the interior the birds were always uncommon and disappeared early. The last Michigan record is in 1883[51]. The last Ohio record is in 1878[10]. The last Wisconsin records are April 27, 1899[52], and September 10, 1912, the latter specimens a male taken at Fox Lake, Dodge County, Wisconsin[53]. The last Indiana record is, with some doubt, April 19, 1890[54].

We have no definite records of the Eskimo Curlew in Nebraska during the territorial days, aside from the recollections of the few survivors among our earliest settlers of enormous flights of "Prairie Pigeons" which passed through the territory each spring. As to the abundance of these birds in Nebraska during

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[49]Benson, F. S. Forest and Stream, ii, p. 341, 1874.
[51]Barrows, W. B. Birds of Michigan.
[52]Schoenbeck, A. J. Birds of Oconto County, pp. 1-51, 1902.
[53]Snyder, W. E. Auk, xxx, pp. 269-270, 1913.
[54]Butler, A. W. Auk, xxiii, p. 274, 1906.

the early years of its statehood, the observations of Professor Lawrence Bruner, who distinctly remembers the flights which occurred in the vicinity of Omaha during the years 1866-1868, when he was a boy ten or twelve years old, are indicative. The birds would arrive about the time the later willows began to bloom (latter April), being present in force for a week or ten days only, for by the time all of the wild plum blossoms had fallen (middle May) the birds were gone. Usually the heaviest flights occurred coincident with the beginning of corn planting time, and enormous flocks of these birds would settle on the newly plowed fields and on the dry burnt-off prairies, where they searched industriously for insects.

These flocks reminded the settlers of the flights of Passenger Pigeons and the curlews were given the name of "Prairie Pigeons." They contained thousands of individuals, and would often form dense masses of birds extending for a quarter to a half mile in length and a hundred yards or more in width. When the flock would alight the birds would cover forty or fifty acres of ground. During such flights the slaughter of these poor birds was appalling and almost unbelievable. Hunters would drive out from Omaha and shoot the birds without mercy until they had literally slaughtered a wagon load of them; the wagons being actually filled and often with the sideboards on at that. Sometimes when the flight was unusually heavy and the hunters were well supplied with ammunition their wagons were too quickly and easily filled, so whole loads of the birds would be dumped on the prairie, their bodies forming piles as large as a couple of tons of coal, where they would be allowed to rot while the hunters proceeded to refill their wagons with fresh victims and thus further gratify their lust of killing. The compact flocks and tameness of the birds made this slaughter possible, and at each shot usually dozens of the birds would fall. In one specific instance a single shot from an old muzzle-loading shotgun into a flock of these curlews as they veered by the hunter brought down twenty-eight birds at once, while for the next half mile every now and then a fatally wounded bird would drop to the ground dead. So dense were the flocks when the birds were turning in

One of seven Eskimo Curlews shot from a flock of eight at Clarks, Merrick county, Nebraska, April 20, 1911, by Mr. P. I. Hoagland of Omaha. Specimen in N. O. U. collection. The last known taking of the bird in Nebraska, and one of the last records from anywhere.

their flight that one could scarcely throw a brick or other missle into it without striking a bird.

The decade 1870-1880 witnessed the beginning of the diminution of these great flocks of Eskimo Curlew. In addition to the numerous gunners who shot these birds for local consumption or simply for the love of killing, there developed a class of professional market hunters who made it a business to follow the "flight birds" as they made their annual journey across the state each spring. Mr. Wheeler, living near Norfolk, pursued this business during the latter '70's, and his observations, transmitted to me by Mr. L. Sessions of that place, describe graphically the status of the bird at this period and also the typical methods of the market hunter in securing these birds.

The chief feeding grounds of these curlews at the time Mr. Wheeler came to Nebraska (1877) was in York, Fillmore and Hamilton counties, and their heaviest lines of northward migration across the state was between the 97th and 98th meridians. The birds were much less numerous north of the Platte river than on the South Platte feeding grounds, although they were noted there, but not in large flocks. One spring, about 1879, while working on the Marshall Field ranch in Madison county, following a heavy south wind, birds which seemed to have been driven past their feeding grounds by the wind were seen flying southwardly, very close to the ground, apparently going back to this South Platte feeding ground. The birds used to come in about the 18th to the 25th of April, all arriving between these dates, and would remain until about the 15th to the 25th of May. Early in the season, when they first arrived, they would frequent the burnt-over prairies, where they would occur in flocks of from a dozen to three or four hundred. As the season advanced the different smaller flocks would bunch up until as many as a thousand birds had assembled, but this assemblage was obviously made up of many small flocks. In later years when these prairies commenced to be extensively broken up and farmed, the curlews used to feed a great deal in the open wheat fields, and toward the last they were found very frequently in tame meadows.

In hunting these curlew, the field glass was used by the hunters to follow their flights. The fields where they were prone to gather were patrolled many times during the day, and carefully scanned with the glass to discover the flocks on the ground. When the birds came in they would be up quite high, perhaps from two or three hundred yards to a quarter of a mile, and in preparing to alight they would turn and wheel, towering in the air while they whistled softly, would hover a while, and then all drop and come down, flying along over the ground for a short distance before alighting. The birds would always alight all at once and very close together, and if the day were warm they would sit down very close together on the ground, forming bunches, when they could be readily discovered with the field glass and approached close enough to get a shot.

There was no difficulty in getting quite close to the sitting birds, perhaps within twenty-five or thirty-five yards, and when at about this distance the hunters would wait for them to arise on their feet, which was the signal for the first volley of shots. The startled birds would rise and circle about the field a few times, affording ample opportunity for further murderous discharge of the guns, and sometimes would realight on the same field, when the attack would be repeated. Mr. Wheeler has killed as many as thirty-seven birds with a pump gun at one rise. They weighed just about one pound each when they were fat. Sometimes the bunch would be seen with the glass alighting in a field two or three miles away, when the hunters would at once drive to that field with a horse and buggy as rapidly as they could, relocate the birds, get out and resume the fusillade and slaughter. On rainy days the birds would fly restlessly from one field to another, moving about in this way most of the day and seeming unusually plentiful because of being so much in the air.

Other observers in the North Platte country corroborate the observations of Mr. Wheeler as to the comparative infrequency of this bird north of the Platte river during these flights of the '70's as compared with the enormous flocks found in the South Platte region. Removing from Omaha to West Point in 1869, Professor Bruner recalls that though he noted the birds each spring the

flocks were usually much smaller than the enormous flights seen at Omaha, usually consisting of 50 to 100 birds, though occasionally of considerable size. Year by year the birds decreased in numbers, until by 1878, in which year Professor Bruner entered the services of the Government, they were seen only in small flocks or individually here and there. During these eight or nine years he mounted several of these curlews, three or four for the University Museum (all of which have since disappeared), a pair for the Omaha Deaf and Dumb Institute and a pair for the Union Pacific Railroad company.

Mr. L. Sessions moved to Madison county in May, 1871, and his acquaintance with the Eskimo Curlew began at that time. The birds were then very abundant and could be found moving about over the burnt prairies or an occasional plowed field, in search of food. The flocks were not large, about thirty or forty birds in a flock, on the average, and the banding together of numerous flocks such as occurred in the South Platte feeding grounds was not observed in Madison county, which furnished no special attraction as to feeding grounds. During these days food was somewhat scarce in Nebraska, and many of the settlers were led to look forward to this spring flight of the curlews as a helpful source of food supply. Mr. Sessions possesses a specimen of this curlew which was secured in these early days, for he has not seen a living bird for many years now, nor has he had any sent him to be mounted.

Mr. W. A. Elwood, who as a boy hunter in the '70's shot quite a number of these birds in Antelope county, states that they were numerous in flocks of thirty or forty birds, appearing about the first week in May and remaining only a very short time, just long enough to feed. He has not seen the bird for the past twenty years or more. Mr. A. J. Leach of Oakdale remembers these birds passing northward in the spring during the '70's while he was plowing for corn, probably from the middle to the last of April. These flocks consisted of from twenty to forty birds, and they used to alight on the plowed ground and stubble lands to feed. He also has not seen an Eskimo Curlew for a quarter of a century past. Mr. Sanders, a guide and old hunter of Clarks,

who lived at Silver Creek up to the early '90's, told Mr. P. I. Hoagland that in the early days the birds were very abundant there, as much so as the Passenger Pigeon in the east, and that hundreds would be shot in a single day.

In the '80's the Eskimo Curlew began decreasing rapidly. Apparently many of the birds moved their line of migration to the westward. Gunners reported flights passing through Grand Island, Kearney and North Platte after they had practically disappeared from eastern Nebraska, but no specimens are extant to verify these reports. April 2, 1884, the species was reported from Alda, Nebraska[8]. Rev. J. M. Bates informs me that Warden D. A. Piercy of All Saints' church at Kennedy, Cherry county, states that during the first years of his residence there, 1885-1887, the Eskimo Curlew was as common as its congener, the Long-billed Curlew. In 1889 Rev. Bates saw a mounted specimen of this bird in a store near Wood Lake, Cherry county, which had been taken near that place. In 1889 Mr. Charles E. Holmes, now of Providence, R. I., reported the Eskimo Curlew as common locally in the hills about forty miles south of Ainsworth, Brown county, though they were decreasing and many were killed by cowboys[10].

By the '90's the Eskimo Curlew was so reduced in numbers that hunters rarely met with it and there are no records of specimens taken during the next twenty years, though it was repeatedly reported as seen by competent observers. In 1896 Mr. I. S. Trostler reported the Eskimo Curlew as still a "common" migrant at Omaha, giving its dates as April 1 to 20 in the spring and October 1 to 15 in the fall. On April 12, 1896, Mr. J. S. Hunter saw a pair of Eskimo Curlew near Stevens creek, several miles east of Lincoln. It might also be mentioned here that about 1897, Mr. P. I. Hoagland saw a flock of these birds near Laramie, Wyoming, so late in the spring that he wondered if the birds could be expecting to nest there.

About the middle of April, 1900, Mr. Paul I. Hoagland and his father, of Omaha, were hunting near Clarks, Nebraska, when a large flock containing seventy or seventy-five birds flew across the road and disappeared over the hill. Mr. Hoagland, Sr., rec-

cognized the birds as the Eskimo Curlew and both men started toward the place where the birds were last seen. They saw a newly plowed field and made toward it and found the entire flock on the freshly plowed land busily engaged in picking up grubs and insects turned up by the plow. The birds were entirely unsuspicious and permitted the hunters to approach as close as desired. The flock was flushed and each hunter made four shots, obtaining in all about thirty-four of the birds. None of them were saved as specimens. This was written up by Mr. Sandy Griswold in the "Omaha World-Herald" at the time, but he called the birds "Golden Plover," which they were not.

Mr. C. W. Tinker, a hardware merchant of Waco, who used to hunt these birds with Mr. Wheeler in the '70's, saw his last Eskimo Curlews in 1904 or 1905 on the old York county feeding grounds. Mr. Wheeler himself saw his last birds in the spring of 1909 or 1910, when nine of these birds were seen near Norfolk, Madison county. He was very close to them and positively identified the birds.

The last records of collected birds for Nebraska were made in the spring of 1911. On March 22, 1911, while Mr. Fred Geiger was shooting ducks near Waco, York county, two of these birds came flying by within gun range and both were shot by him. The birds were identified by an old-time hunter and were then brought to Lincoln and mounted by Mr. August Eiche, in whole collection they are at present. Both birds were females, with well developed ovaries.

On April 20, 1911, while hunting at Clarks, within a mile of the field where the large flock had been seen eleven years before, Mr. Hoagland saw a flock of eight Eskimo Curlews. With little difficulty the entire flock was killed except one bird which made its escape. The birds were brought to Omaha, and Mr. Hoagland, remembering that in spite of almost continual hunting during the open season he had not seen the bird since the large flock eleven years before, or even heard of its being seen, took one of the birds to Mr. Allabaugh, a taxidermist of Omaha, for mounting. Mr. Fred Goodrich, also of Omaha, saw the birds, and when he noted that Mr. Hoagland was about to have one of them mounted

said he would like one mounted also. Two birds were put aside for this purpose. Later, on considering the matter, Mr. Hoagland decided to save all of the birds and gave orders to that effect, but they had already been picked by the cook. Both birds were mounted by Mr. Allabaugh, April 24, 1911, and one is now in the possession of Mr. Fred Goodrich of Omaha, the other in the N. O. U. collection, a gift of Mr. Hoagland through the writer.

Even in these latter captures and observations, when the birds were nearing extinction from incessant persecutions, they were very unsuspicious and apparently fearless. They flew away leisurely in close, compact flocks so that they could scarcely be missed when shot at, and a single discharge would bring down many of the birds.

The most recent records for the Eskimo Curlew would indicate that it is probably not yet wholly extinct. The occurrence of eight and the killing of seven of these birds near Cartwright, Labrador, in August and September, 1912, and the collecting of a male specimen on September 10 of that same autumn while flying alone over decoys along the shore of Fox Lake, Dodge county, Wisconsin, have already been mentioned A specimen was observed on the Bermuda Islands, according to Kennedy, on January 20, 1913[55]. Mr. L. Sessions writes me that a small flock of these birds was seen near Norfolk, Nebraska, in the spring of 1913. On September 5, 1913, a specimen was collected at East Orleans, Massachusetts, it being alone when taken[56]. No records for 1914 are at hand.

In the spring flight these curlews arrived at the same time as the Golden Plover, though they did not always frequent the same localities. The Eskimo Curlew was always uncommon in the fall migration in Nebraska. Most of the observers who have furnished me data on this bird (Messrs. Bruner, Wheeler, Hoagland) have never seen it at that season, but Mr. Elwood thinks he remembers having seen the birds sometime in October, and Mr. A. J. Leach thinks he remembers their passing through south-

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[55]Kennedy, J. N. Ibis, ser. x, ii, 1914.
[56]Lamb, C. R. Auk, xxx, p. 581, 1913.

wardly about October 1. Aughey[57] records a specimen sent him from Bellevue for identification in October, 1874, and states that he had observed the species in northeastern Nebraska in that month.

The Eskimo Curlew had several notes. During flight they uttered a fluttering "tr-tr-tr" note which was given by many individuals at once, and described by Coues as a "low conversational chatter" and by Mackay as "a soft, melodious whistle, *bee, bee.*" Mr. W. A. Elwood describes this note as "a short low whistle," continually repeated by many of the birds simultaneously while in flight. Mr. A. J. Leach recalls the notes as resembling quite closely the note of the bluebird when in flight, only perhaps shorter and more of a twittering whistle, and as it was given by a large number, perhaps all, of the flock as they took wing and while flying, it was difficult to catch the individual note. This note was constantly uttered while the birds were flying and was often audible before the birds could be seen. Before alighting, as they descended and sailed, they gave a soft whistle, somewhat like the note of the Upland Plover, according to Professor Bruner, while as they walked over the ground when feeding they uttered a chiriping whistle as if calling to each other.

The Eskimo Curlew was a bird of such food habits that it is a distinct loss to our agriculture that it should have disappeared. During the invasion of the Rocky Mountain Grasshopper (*Melanoplus spretus*) it did splendid work in the destruction of grasshoppers and their eggs. Mr. Wheeler states that in the latter '70's these birds would congregate on pieces of land which had not been plowed and where the grasshopper eggs were laid, reach down into the soil with their long bills and drag out the egg capsules which they would then devour with their contents of eggs or young 'hoppers, until the land had been cleared of the pests. A specimen examined by Aughey in 1874 had thirty-one grasshoppers in its stomach together with a large number of small berries of some kind[57]. The bird in its migrations often alighted on plowed ground to feed on the white grubs and cutworms

[57]Aughey, S. 1st Rept. U. S. Entomological Comm., Appendix, p. 55, 1878.

turned up by the plow, or in meadow lands, probably feeding on ants in the latter situation. Richardson records finding them feeding on large ants at Fort Franklin in late May 1849[30]. The curlews were rarely seen near water, but were upland birds almost exclusively during their spring migration over the Great Plains region.

The flesh of the Eskimo Curlew is said by all who have eaten it to have been exceedingly well flavored, and, according to Mr Hoagland, the equal if not the superior of any of our large shore birds.

Although the Eskimo Curlew is reduced to the point of extinction, it is probably not yet absolutely extinct, and if the pitiful remnant of the species could be absolutely protected there is still a chance that it might be enabled to recover and be saved. A campaign of education as to the present desperate status of this bird, by all ornithologists and true sportsmen, together with absolute legal protection under high penalties everywhere, and a complete cessation of killing these birds even for specimens, might actually accomplish this result. The recently enacted federal law giving the control of migratory birds to the General Government should be a large help in such a campaign.

MISCELLANEOUS NOTES

SOME BIRD NOTES FROM LINCOLN AND VICINITY

Two Herring Gulls (*Larus argentatus*) were observed flying back and forth over the lake at Capital Beach on April 7, 1912. Dr. H. B. Lowry also reported this species in early April, 1912, at the same locality.

During the past two years the Northern Phalarope (*Lobipes lobatus*) has been present at Capital Beach during the fall migration, the writer having observed small flocks of three to a dozen birds on the following dates: August 24, August 31, and September 7, 1913; September 13 and 20, 1914.

The Buff-breasted Sandpiper (*Tryngites subruficollis*) was noted at the Beach on August 24, 30 and September 13, 1914. On August 24 three birds were seen feeding on the sand, and

were so tame that they permitted the writer and a companion to approach within ten feet, while they continued to feed in seeming indifference. The Buff-breasted Sandpiper seems to prefer the firmer sand of the beach a little back from the water's edge, in which situation the general buff tone of its plumage renders it very inconspicuous.

A single specimen of the Western Sandpiper (*Ereunetes mauri*), which had been crippled by hunters at the Beach, was taken by the writer on August 31, 1913, and is now preserved in the collection of the State Entomologist. Mr. J. E. Wallace reported this bird to be present in rather large numbers at about this date, or a little earlier, when he took several specimens. These constitute the first definite records of the Western Sandpiper in Nebraska.

Two Marbled Godwits (*Limosa fedoa*) were seen at the Beach on May 9, 1914. A single specimen was seen on August 2, and again on August 9, 1914.

A Pigeon Hawk (*Falco columbarius columbarius*) was clearly seen, and definitely identified by the writer on November 5, 1911.

While the Burrowing Owl (*Speotyto cunicularia hypogaea*) is an abundant breeder in the sandhill region of Nebraska, it is not very common in the eastern part of the state, and the finding of a colony of these owls near Lincoln seems worthy of note. On April 12, 1914, Mr. E. A. Markham discovered a colony of about a dozen pairs of Burrowing Owls one-half mile north of the "O" street road and a mile west of Stevens' creek. The colony was later visited by the writer on April 19 and 25 and again on May 17 and 24, 1914. The colony appeared to be deserted on October 28, 1914, when it was visited in the hope of getting some photographs.

An unusually early date for the Yellow-billed Cuckoo (*Coccyzus americanus americanus*) seems worthy of note. On April 22, 1914, the writer and a companion approached to within fifteen feet of a Yellow-billed Cuckoo as it sat in a small leafless tree in Wyuka Cemetery.

The Red-bellied Woodpecker (*Centurus carolinus*) is occasionally seen at Lincoln, as is indicated by the following dates

taken from the writer's migration notes: October 23 and 31, 1909; November 6, December 18, and March 6, 1910; May 3, 1914.

Three female Purple Finches (*Carpodacus purpureus purpureus*) were noted in Wyuka Cemetery on April 24, 1914. They were feeding on ash seeds, and remained in the same tree for at least an hour.

A male Lazuli Bunting (*Passerina amoena*) was seen in the woods along Stevens' creek on May 12, 1912.

A single Lark Bunting (*Calamospiza melanocorys*) was observed on August 17, 1913. Possibly the exceedingly hot and dry weather of that summer caused the Lark Bunting to drift eastwardly further than usual. Messrs. M. H. Swenk and L. M. Gates saw a male Lark Bunting near the University Farm campus on May 11, 1914.

A male Yellow-throated Vireo (*Lanivireo flavifrons*) was seen on May 25, 1913.

On the morning of May 3, 1911, Dr. H. B. Lowry telephoned Mr. M. H. Swenk that he had just seen the Palm Warbler (*Dendroica palmarum palmarum*) in Wyuka Cemetery, so in the afternoon Messrs. Swenk, Zimmer and the writer visited the cemetery in the hope of also seeing the bird. We had the good fortune to definitely identify a male of this rather uncommon warbler. On May 11, 1913, the writer in company with Mr. E. A. Markham had an excellent opportunity to observe one of these warblers in the woodlands north of Capital Beach. Another specimen was seen May 2, 1914, at Capital Beach.

A male of the Wilson Warbler (*Wilsonia pusilla pusilla*) was observed in the Cemetery on May 3, 1914.

A Red-breasted Nuthatch (*Sitta canadensis*) was seen at the same locality on April 15, 1914, and the Gray-cheeked Thrush (*Hylocichla aliciae aliciae*) on May 10, 1914.

R. W. Dawson, *Lincoln.*

Three Records from the Nebraska Experimental Sub-Station at North Platte.—On June 26, 1914, I had a pair of Western Blue Grosbeaks (*Guiraca caerulea lazula*) under observation for half an hour or more. They were in the tree planta-

tions on the bench land, and often flew to a wire fence which bounds the road on the east side. I made quite a search for a nest, but was unsuccessful. The birds were in bright plumage, and, according to the farm attendants, had been there for some time.

On July 2, 1914, while my family and I were picnicking in the forest plantations on the table we found a nest of the Western Lark Sparrow (*Chondestes grammacus strigatus*). The nest was in some second growth mulberry, and was placed about two feet from the ground. It contained four birds about half grown, and was identified by the behavior of the parent birds, both of which flew excitedly about us. At least a dozen adults were seen among the dead trees of the black locust plat, just east of the mulberry plat. Another nest, similarly placed and in the same plat, contained four newly hatched birds, but we were unable to identify this nest because of its proximity to the first one and the consequent uncertainty as to whether the excited Lark Sparrows might not be the same we saw at the first nest.

On the same date we saw and heard two Mockingbirds (*Mimus polyglottos leucopterus*). Our familiarity with the bird in the eastern part of the state left no question of its specific identity and the song also made it certain. We could not find a nest. In conversation with Superintendent Snyder of the Sub-station, at a later date, he informed me that the boys had found a dead Mockingbird on the farm, a few weeks before. This is my first record of the Mockingbird at North Platte during the seven years of my residence here.

Wilson Tout, *North Platte.*

VOL. VI, PART 3 JULY 10, 1915

PROCEEDINGS OF THE

NEBRASKA ORNITHOLOGISTS' UNION

SIXTEENTH ANNUAL MEETING

OFFICERS

1914-15. President.....T. C. Stephens, Sioux City, Iowa
Vice-President.....Mrs. G. A. Loveland, Lincoln
Secretary-Treasurer.....R. W. Dawson, Lincoln

ABSTRACT OF MINUTES

The sixteenth annual meeting of the Nebraska Ornithologists' Union was held at Omaha, Nebraska, Friday and Saturday, May 7 and 8, 1915. The mebers gathered at the Castle Hotel, Sixteenth and Jones Streets, at 6:00 P. M., for the annual banquet. Ten members and twelve guests of members were present, the members being Messrs. Bruner, Dawson, Stephens, Swenk and Wolcott, and Mesdames Button, Evans, Loveland, McDonald and VanSant. The guests were Mr. and Mrs. H. D. Neely, Misses Damon, Duffy, Graves, Patrick, Stenger and Stringer, and Messrs. P. I. Hoagland, J. W. Miller and S. R. Towne, all of Omaha, and Mr. W. B. Johns, of York.

Following the dinner, at 7:15, President T. C. Stephens called the meeting to order. The report of the Secretary-Treasurer was received, and R. H. Wolcott and Mrs. G. A. Loveland appointed as an Auditing Committee. L. Bruner and Miss McDonald were also appointed as a Nominating Committee. The Secretary then read a telegram from Wilson Tout, expressing his

regret at not being able to be present and wishing the Society a successful metting. The interim election of Mrs. Lily R. Button to membership in the Union was formally approved, and the following nine new members elected to the Union: Prof. W. B. Johns, of York; Mr. B. J. Olson, of Kearney; Mr. Thos. R. Hill, Mrs. H. D. Neely, Mrs. W. F. Baxter, Miss Ione C. Duffy and Miss Elizabeth Rooney, of Omaha, and Mrs. W. E. Barkley and Miss Anne Stuart, of Lincoln. Miss Caroline Stringer, a former member who resigned in 1907, was, at her request, reinstated to membership in the Society.

The question of affiliation with the Wilson Club was then taken up. The proposed plan was outlined and explained by M. H. Swenk, who read the following articles of agreement as the proposed basis of affiliation:

ARTICLES OF AGREEMENT

The following Articles of Agreement, looking toward an affiliation between the Nebraska Ornithologists' Union and the Wilson Ornithological Club, are to be presented to the N. O. U. at its Annual Meeting at Omaha, May 7, 1915, and to the W. O. C. at its Annual Meeting at Chicago, in December, 1915.

In the event of their constitutional adoption by both Societies, these Articles of Agreement are to go into effect at the time of the Seventeenth Annual Meeting of the N. O. U. in May, 1916.

These Articles of Agreement are to be made in duplicate, and one properly signed copy is to remain in the archives of each Society concerned.

ARTICLE I.

The Nebraska Ornithologists' Union shall continue as an autonomous organization, with the same local meetings and field days and the same membership limitations as in the past, but it shall in the future be regarded in addition as an auxiliary of the Wilson Ornithological Club, in the sense that the Wilson Bulletin shall become its official organ and that every member of the N. O. U. becomes automatically an active member, with voting privileges, of the W. O. C.

ARTICLE II.

An appropriate statement of the relation of the Wilson Bulletin to the N. O. U. shall appear on the title page and the editorial page of the Wilson Bulletin, so long as such relationship exists. The publication of

the "Proceedings" of the N. O. U. shall be discontinued at the close of Volume 6, before May 1, 1916, after which the Wilson Bulletin shall print brief proceedings of the Annual Meetings of the N. O. U.

ARTICLE III.

A clear and detailed statement of the affiliation of the N. O. U. with the W. O. C., together with a brief historical sketch of the N. O. U. and its "Proceedings," shall be publishel in the first issue of the Wilson Bulletin after the affiliation is consummated.

ARTICLE IV.

The Secretary-Treasurer of the N. O. U. shall collect from the members of that organization $2.00 annual dues, and shall pay to the Treasurer of the W. O. C., at the beginning of the fiscal year of the N. O. U., $1.50 as dues in the W. O. C. for each member of the N. O. U. in good standing, at the same time transmitting to the Treasurer, or other proper officer, of the W. O. C., a corresponding list of the members of the N. O. U. in good standing. The 50 cents collected by the N. O. U. above its obligation to the W. O. C. shall be used for the general expenses of the N. O. U. and to assist in the publication of independent (not serial) monogrpahic papers on the birds of Nebraska, and such publications shall bear the imprint of both the N. O. U. and the W. O. C. Such papers shall be sold by the N. O. U. to its members and to members of the W. O. C. who may desire them at cost.

ARTICLE V.

It shall be agreed between the N. O. U. and the W. O. C. that the former organization shall be under no financial, or other, obligation to the W. O. C. beyond the payment of the $1.50 annual dues of its members, and that the W. O. C. shall not be responsible for any debts incurred by the N. O. U.

ARTICLE VI.

If the affiliation be effected, then such persons as are, at the time, members both of the N. O. U. and W. O. C., may continue to hold both such memberships by the payment of regular annual dues to the N. O. U.

At the conclusion of his remarks, in order to put the question before the Union, M. H. Swenk moved the adoption by the N. O. U. of the Articles of Agreement, as read The motion was promptly seconded. It was then discussed by R. H. Wolcott, Miss VanSant, L. Bruner and T. C. Stephens. The motion was put and unanimously carried.

M. H. Swenk then moved the adoption of the following amendments to the Constitution and By-Laws of the N. O. U., as

printed on pp. 19-22 of this Volume, made necessary by the adoption of the above Articles of Agreement, *contingent upon* the adoption of these Articles of Agreement by the Wilson Ornithological Club at their next Annual Meeting:

Article I, Section 1. Add to line 2, "and is an affiliation of the Wilson Ornithological Club."

Article I, Section 2. Insert the word "local" before "students" in line 2.

Article V, Section 3. Replace the phrase "to superintend the publication of the Proceedings of the Union," in lines 6 and 7, with the phrase "to superintend the printing of any publications of the Union," and immediately thereafter insert "to co-operate with the proper officers of the Wilson Club on all matters relative to the affiliation."

Article VIII, Section 1. Insert the words "in advance" after "due" in line 2, and add: "These dues shall also entitle the members to active membership in the Wilson Ornithological Club."

Article VIII, Section 2. Replace the phrase "before the close of the year" in lines 2 and 3, with "before the end of the annual meeting beginning the new fiscal year," and the phrase "publications of the Union" to "the official organ of the Union, the Wilson Bulletin."

By-Laws, Section 2. Replace "one copy of the publications of the Union" with "the Wilson Bulletin for the current year," and omit the last sentence.

The motion was seconded and unanimously carried.

The report of the Nominating Committee was then received and the following officers were elected for 1915-16:

President, R. W. Dawson, Lincoln.

Vice-President, Mrs. Lily Ruegg Button, Fremont.

Secretary-Treasurer, M. H. Swenk, Lincoln.

At 8:00 P. M. the business meeting adjourned, allowing the members to meet a few minutes later in the lecture room of the Omaha Public Library for the public program. Mrs. Button, of Fremont, first gave a very enjoyable talk on "Bird Songs," analyzing the songs of about thirty of our birds by way of illustration. M. H. Swenk, of Lincoln, gave an account of "The Nesting of the Brewer Sparrow in Western Nebraska," illustrating his remarks with photographs and specimens of the bird, its nest and eggs. Retiring President T. C. Stephens of Sioux City, then concluded the program with a resume of the "Breeding Habits of Birds, with Particular Reference to the Feeding of the Young," which was exceedingly interesting to the hearers.

At 10:00 P. M. the meeting adjourned.

RALPH W. DAWSON,
Secretary-Treasurer.

THIRTEENTH ANNUAL FIELD DAY.—On Saturday, May 8, 1915, about forty members and guests of the N. O. U. spent the day in the woods at Child's Point south of Omaha. The day was cool and clear, with a strong northwest wind. The composite list numbered seventy-six species, as follows:

Bluebird, Robin, Wood Thrush, Blue-gray Gnatcatcher, Long-tailed Chickadee, Red-breasted Nuthatch, White-breasted Nuthatch, Western House Wren, Brown Thrasher, Catbird, Redstart, Yellow-breasted Chat, Maryland Yellow-throat, Grinnell Water-Thrush, Ovenbird, Myrtle Warbler, Yellow Warbler, Palm Warbler, Tennessee Warbler, Blue-winged Warbler, Prothonotary Warbler, Black and White Warbler, White-eyed Vireo, Yellow-throated Vireo, Warbling Vireo, Red-eyed Vireo, Migrant Shrike, Bank Swallow, Tree Swallow, Barn Swallow, Scarlet Tanager, Dickcissel, Indigo Bunting, Rose-breasted Grosbeak, Cardinal, Towhee, Fox Sparrow, Swamp Sparrow, Lincoln Sparrow, Song Sparrow, Western Field Sparrow, Clay-colored Sparrow, Chipping Sparrow, Gambel Sparrow, Harris Sparrow, Lark Sparrow, Savannah Sparrow, Pine Siskin, Goldfinch, Rusty Blackbird, Baltimore Oriole, Western Meadowlark, Red-winged Blackbird, Cowbird, Crow, Blue Jay, Prairie Horned Lark, Least Flycatcher, Wood Peewee, Phoebe, Crested Flycatcher, Arkansas Kingbird, Chimney Swift, Northern Flicker, Red-headed Woodpecker, Downy Woodpecker, Hairy Woodpecker, Belted Kingfisher, Black-billed Cuckoo, Red-shouldered Hawk, Cooper Hawk, Mourning Dove, Bittern, Shoveller, Blue-winged Teal.

REPORT OF TREASURER, 1914-15.

RECEIPTS

Cash received from previous Treasurer, May 15, 1914	$100.58
3 Annual dues for 1912	6.00
13 Annual dues for 1913	26.00
12 Annual dues for 1914	24.00
4 Annual dues for 1915	8.00
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EXPENITURES

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Baker Bros. Engraving Co., making halftone for Vol. VI, Part 2	3.75
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Respectfully submitted,

RALPH W. DAWSON, *Secretary-Treasurer.*

LIST OF MEMBERS

Additions and Corrections only, to May 7, 1915.

ADDITIONS

Barkley, Mrs. W. E., 1827 E Street, Lincoln....1915
Baxter, Mrs. W. F., 139 No. 32nd Avenue, Omaha....1915
Button, Mrs. Lily Ruegg, 616 West 8th Street, Fremont....1915
Duffy, Miss Ione C., 2219 Dodge Street, Omaha....1915
Hill, Thomas R., 552 Bee Bldg., Omaha....1915
Johns, Prof. W. B., York, Nebraska....1915
Neely, Mrs. H. D., 4371 Hamilton Street, Omaha....1915
Olson, Mr. B. J., Armitage-Olson Drug Co., Kearney....1915
Rooney, Miss Elizabeth, 2802 Dodge Street, Omaha....1915
Stringer, Miss Caroline, Omaha High School, Omaha....1915
Stuart, Miss Anne, 1906 D Street, Lincoln....1915

ELIMINATIONS

Duncanson, H. B., Peru....1901
Luke, W. A., Secretary City Y. M. C. A., Lincoln....1913
Shipherd, Miss Maude, 4811 Davenport Street, Omaha....1911
Skinner, W. R., 3161 Kleckner Court, Lincoln....1904

BIRD MIGRATION AT LINCOLN, NEBRASKA, SPRING OF 1913. (JANUARY 1—JUNE 1.)†

Pied-billed Grebe—April 29 at Arbor (Z); May 11 (L).

Loon—April 13 (D).

Herring Gull—May 11 (W); 20 (S and Z).

Ring-billed Gull—April 11 (D and S); 13 (D); May 4 (L); 10 (S and Z); 17 (D and S); 18 (Z); 21 (*D, S and Z).

Franklin Gull—April 11 (D and S); 12 (B and S); 13 (L); 27 (Z); May 4 (D and Z); 10 (Z); 11 (D); 17, large flock (D and S); 18 (D); 20 (S and Z); 21 (D, S and Z).

Bonaparte Gull—May 18, four (Z); 20 (S and Z).

Caspian Tern—May 11 (L); 18, one (D); 20 (Z).

Forster Tern—May 11 (L); 20 (S and Z).

Least Tern—May 18, two (Z).

Black Tern—May 10 (S and Z); 11 (D); 17 (D and S); 18 (D and Z); 20 (S and Z); 21 (D, S and Z); 22 (Z); 25 (D and S).

White Pelican—April 9, flk 15 (S).

American Merganser—May 11 (L).

Red-breasted Merganser—May 10 (Z).

Hooded Merganser—March 21 at Greenwood (*E).

Mallard—Feb. 16 (W); March 24 at Greenwood (*C. H. Frey); April 1 (L); 2 at Greenwood (*Geo. Dayton); 11 (D and S); 12 (B and S); May 10 (S).

Gadwall—April 6 (L); 12 (B and S); 27 (Z); May 20 (Z).

Widgeon—Feb. 18 (W); April 11 (D and S); 12 (*B and S); 27 (Z).

Green-winged Teal—Feb. 16 (W); March 23 (D); 30 (D); April 2 at Greenwood (*Geo. Dayton); 12 (B and S).

Blue-winged Teal—March 24 at Greenwood (*C. H. Frey); April 1 (L); 11 (D and S); 12 (B and S); 13 (D); 27 (D and Z); 29 (D and S); May 4 (D and Z); 7 (E); 10 (S and Z); 11 (D); 17 (D and S); 18 (D and Z); 21 (D, S and Z).

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†Compiled from the notes of members of the "Lincoln Bird Club"; B—L. Bruner; D—R. W. Dawson; E—A. Eiche; L—H. B. Lowry; S—M. H. Swenk; W—R. H. Wolcott; Z—J. T. Zimmer.

*—Specimen taken.

Cinnamon Teal—April 12, 3 pairs seen (B and S).

Shoveller—April 1 (L); 2 at Greenwood (*Geo. Dayton); 5 (S); 11 (D and S); 12 (B and S); 13 (D); 27 (Z); 29 (D and S); May 7 (E); 10 (S and Z); 11 (D); 17 (D and S); 18 (D and Z); 20 (S and Z); 21 (D, S and Z).

Pintail—Jan. 29 (W); Feb. 16 (L and W); March 24 at Greenwood (*C. H. Frey); April 2 at Greenwood (*Geo. Dayton); 11 (D and S); 12 (B and S); 13 (D); May 10 (S); 18, one (Z).

Canvasback—March 24 at Greenwood (C. H. Frey); 25 at Greenwood (E).

Lesser Bluebill—March 24 at Greenwood (C. H. Frey); April 1 (L); 2 (D); 2, at Greenwood (Geo. Dayton); 5, flks of 200-300 at Lake (S); 11, large flks (*D and S); 12 (B and S); 13 (S); 27 (D and Z); 29 (D and S); May 7 (E); May 10 (Z); 11 (D); 20 (Z).

Ring-necked Duck—Mar. 15 (W); May 11 (L).

Ruddy Duck—May 10 (Z); 11 (L); 21 (D, S and Z).

Greater Snow Goose—April 12 (B, S and W).

Lesser Snow Goose—April 1 (L); 11 (D and S); 13 (D); May 4 (Z).

Blue Goose—March 25 at Greenwood (*E).

Canada Goose—January 25 (Z); Feb. 16 (W); March 30 (D); April 1 (L); 2 (S); 11 (D and S); 27 (Z).

Hutchins Goose—April 12, flk of 200 or more (B and S); 13 (L).

Bittern—May 11 (D); 15 (Z); June 1 (Z).

Green Heron—May 4 (D); 11 (D); 18 (Z); 20 (Z).

Black-crowned Night Heron—May 11 (L); 18 (Z).

Whooping Crane—March 29 at Greenwood, 5 in flk of 8 (John Armstrong).

Sand-hill Crane—March 29 at Greenwood, 3 in flk of 8 (John Armstrong).

Virginia Rail—May 18 (Z); June 1 (Z).

Coot—April 1 (L); 2, one bird (D); 11, hundreds (D and S); 12 (B and S); 13 (D); 27 (Z); 29 (D and S); May 10 (S and Z); 11 (D); 17 (D and S); 18 (D and Z); 20 (S and Z); 21 (D, S and Z); 27 (Z); 30 (Z).

Northern Phalarope—May 11 (L); 20 (Z).

Wilson Phalarope—April 20 (L); 27 (*Z); 29 (D and S); May 4 (Z); 7 (E); 11 (D); 17 (D and S); 18 (D); 20 (Z).

Wilson Snipe—April 2 at Ceresco (Geo. Dayton); 13 (D); 30 (Z).

Long-billed Dowitcher—May 11 (L).

Stilt Sandpiper—May 11 (L); 15 (E); 17 (D and S); 18 (D and Z); 20 (S and Z); 21 (*D, S and Z); June 2 (*Wallace).

Pectoral Sandpiper—April 12 (B and S); 29 (D and S); May 4 (L); 10 (Z); 11 (D); 17 (D and S); 18 (D and Z); 20 (S and Z); 21 (Z).

White-rumped Sandpiper—May 4 (L); 7 (E); 10 (S and Z); 11 (D); 15 (Z); 17 (D and S); May 18 (D and Z); 20 (S and Z); 21 (D, S and Z); 28 (Z).

Baird Sandpiper—April 12 (B and S); 13 (D and L); 27 (Z); May 7 (E); 11 (L); 10 (S and Z); 11 (D); 15 (Z); 18 (Z); 20 (S and Z); 21 (S and Z); 28 (Z).

Least Sandpiper—April 12 (B and S); 13 (D); 29 (D and S); May 4 (L); 10 (S and Z); 11 (D and L); 17 (D and S); 20 (S and Z); 21 (S and Z).

Red-backed Sandpiper—May 11 (L); 17 (S); 18 (D and Z); 21 (D).

Semipalmated Sandpiper—April 27 (Z); 29 (D and S); May 4 (L); 7 (E); 10 (S and Z); 11 (D and L); 17 (D and S); 18 (D and Z); 20 (*S and Z); 21 (*D, S and Z); 28 (Z).

Sanderling—May 11 (L); 17 (D and S); 20 (S and Z); 21 (*S and Z).

Hudsonian Godwit—May 10 (Z); 18 (D).

Greater Yellowlegs—April 2 at Greenwood, 2 shot (*E); 28 (Z); 29 (Z); May 4 (Z); 10 (S and Z); 11 (L).

Yellowlegs—April 12 (B and S); 13 (D); 27 (*Z); 29, hundreds (D and S); May 4 (D and Z); 10 (S and Z); 11 (D and L); 15 (Z); 17 (D and S); 18 (D and Z); 20 (S and Z); 21 (S and Z); 28 (Z).

Solitary Sandpiper—May 4 (D and Z); 10 (S and Z); 11 (L).

Western Willet—April 27 (L); May 10 (Z); 11 (D and L); 15 (E); 17 (D and S); 20 (Z).

Upland Plover—April 13 (L); 29 at Davey (Z); 30 (Z); May 4 (Z).

Spotted Sandpiper—April 27 (L and Z); 29 (S); May 4 (Z); 10 (S and Z); 11 (D); 17 (D and S); 18 (D and Z); 20 (S and Z); 21 (D, S and Z); 28 (Z).

Black-bellied Plover—May 11 (D and L); 18 (D).

Killdeer—March 9 (D); 30 (D); April 2 (D); 5 (S); 6 (L); 11 (D and S); 12 (B and S); 13 (D and S); 27 (Z); 29 (D and Z); 30 (Z); May 10 (Z); 11 (D); 17 (D and S); 18 (Z); 20 (S and Z); 21 (D).

Semipalmated Plover—April 27 (L); May 7 (E); 10 (S); 11 (D); 17 (D); 18 (D and Z); 20 (*S and Z); 21 (*S and Z).

Piping Plover—May 7 (E); 11 (L); 18 (D and Z).

Turnstone—May 11 (D and L); 15 (E); 17 (D and S); 20 (S and Z); 21 (S and Z); June 2 (*Wallace).

Bobwhite—April 13 (L); May 10 (Z); 11 (D); 17 (D and S); 18 (Z); 20 (S and Z); 21 (Z).

Mourning Dove—April 11 (D); 12 (B and S); 13 (D and L); 15 (Z); 17 (D); 20 (D); 27 (D and Z); 29 (D and S); 30 (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D, S and Z); 18 (D, S and Z); 19 (Z); 20 (S and Z); 21, nesting (D, S and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z).

Marsh Hawk—April 11 (D and S); 12 (B and S); 20 (D); May 11 (L).

Sharp-shinned Hawk—March 9 (D).

Cooper Hawk—April 20 (L); May 2 (Z).

Red-tailed Hawk—March 30 (D); April 20 (D and L); 27 (Z); May 4 (D); 18 (S).

Swainson Hawk—April 27 (D).

Broad-winged Hawk—May 11 (Z); 13 (Z); 24 (Z).

American Rough-leg—May 18 (Z).

Ferruginous Rough-leg—January 25 (Z); March 30 (D); April 20 (D); May 4 (D).

Prairie Falcon—April 27 (Z).

Sparrow Hawk—March 13 (D and L); May 10 (Z); 11 (Z).

Osprey—May 11 (W).

Long-eared Owl—Jan. 25 (L).

Short-eared Owl—(W).

Barred Owl—(W).

Screech Owl—Jan. 25 (L); March 2 (D); April 2 (D); 20, nesting (D); 27, nesting (D).

Yellow-billed Cuckoo—May 10 (S); 11 (L and Z); 13 (Z); 14 (Z); 15 (Z); 18 (Z); 25 (D and Z); 26 (Z).

Black-billed Cuckoo—May 13 (Z).

Belted Kingfisher—April 2 (W); 13 (D and L); 15 (Z); 27 (D); May 4 (D); 18 (Z).

Hairy Woodpecker—January 26 (D); February 9 (D); 18 (D); Mar. 9 (L); April 8 (D); 20 (D); May 4 (D); 11 (D); 25 (Z); June 1 (Z).

Downy Woodpecker—January 25 (L and Z); 26 (D); February 9 (D); 18 (D); March 9 (D); 23 (D); 30 (D); April 2 (D); 6 (D); 12 (B and S); 20 (D); 27 (D and Z); 30 (Z); May 2 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D and Z); 20 (Z); 21 (Z); 25 (D and Z); 26 (Z); June 1 (Z).

Red-headed Woodpecker—April 30 (L); May 2 (Z); 4 (Z and S); 7 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D and Z); 19 (S and Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z).

Northern Flicker—January 26 (D); February 9 (D); Mar. 9 (D and L); 23 (D); 30 (D); Apr. 2 (S); 6 (D); 11 (D and S); 12 (B and S); 13 (D and S); 17 (D); 20 (D); 27 (D and Z); 28 (Z); 29 (D and S); 30 (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D, S and Z); 20 (Z); 21 (D

and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z).

Red-shafted Flicker—January 26 (D); February 9 (D); April 5 (S); 6 (L); 13 (D).

Nighthowk—May 8 (S); 14 (Z); 17 (S); 18 (S); 21 (Z); 25 (D and Z); 26 (Z).

Chimney Swift—April 30 (L and W); May 1 (S and Z); 2 (Z); 4 (D); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (S and Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D, S and Z); 18 (Z); 20 (Z); 21 (D and Z); 22 (Z); 24 (Z); 25 (Z); 26 (Z); 27 (Z); 28 (Z); 30 (Z).

White-throated Rock Swift—April 30 (Z).†

Ruby-throated Hummingbird—May 12 (D); 25 (*Z).

Kingbird—April 27 (L and Z); 29 (D and S); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D, S and Z); 18 (D, S and Z); 19 (Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 28 (Z); June 1 (D and Z).

Arkansas Kingbird—April 30 (Z); May 4 (D); 11 (D and L); 21 (D); 23 (Z).

Great-crested Flycatcher—May 4 (D and Z); 7 (Z); 8 (Z); 11 (L and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 18 (Z); 25 (*D and Z).

Phoebe—March 23 (D); 30 (D); April 2 (D); 6 (D and L); 20 (D); 27 (D and Z); 30, nesting (Z); May 4 (D); 11 (D); 18 (Z); 25 (D); 28 (Z).

Wood Peewee—May 25 (D).

Acadian Flycatcher—May 20 (*Z); 25 (Z).

Traill Flycatcher—May 2 (Z); 4 (D); 10 (Z); 11 (*D, L and Z); 12 (*Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 18 (D and Z); 20 (Z); 21 (D and Z); 22 (Z); 25 (D and Z).

Least Flycatcher—May 8 (Z); 10 (Z); 11 (L); 13 (Z); 14 (Z); 18 (Z); 20 (Z); 21 (Z); 28 (Z).

Prairie Horned Lark—Jan. 25 (Z); 26 (D); Febr. 9 (D); Mar. 9 (D and L); 23 (D); 30 (D); April 2 (D); 6 (D);

†First record for Lincoln (Editor).

11 (D and S); 12 (B and S); 13 (D); 20 (D); 27 (D and Z); 30 (Z); May 2 (Z); 4 (D and Z); 7 (Z); 15 (Z); 18 (Z); 20 (Z); 21 (D and Z); 25 (D); 28 (Z).

Hoyt Horned Lark—Jan. 25 (L).

Blue Jay—Jan. 25 (L and Z); 26 (D); Feb. 18 (D); April 1, migrants (S); 11 (S); 13 (D and S); 27 (D and Z); 29 (D and S); 30 (Z); May 2 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 19 (S and Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 28 (Z); June 1 (D).

Crow—January 11 (Z); 25 (L and Z); 26 (D); Feb. 9 (D); 18 (D); Mar. 9 (D); 23 (D); 30 (D); Apr. 2 (D); 6 (D); 13 (D and S); 17 (D); 20 (D); 27 (D and Z); 30, nesting (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D and Z); 19 (Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z).

Bobolink—May 4 (Z); 11 (L); 15 (Z); 17 (*D and S); 18 (D and Z); 27 (Z); 30 (Z); June 1 (Z).

Cowbird—Apr. 4 (S); 6 (D and L); 11 (D and S); 12 (B and S); 13 (D); 17 (D); 20 (D); 27 (D and Z); 29 (D and S); 30 (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D and Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z).

Yellow-headed Blackbird—Apr. 13 (L); 27 (Z); 29 (D, S and Z); 30 (Z); May 10 (Z); 11 (D); 17 (D and S); 18 (D and Z); 20 (Z); 21 (D and Z).

Red-winged Blackbird—Mar. 9 (L); 23 (D); 30 (D); Apr. 2 (D and W); 11 (D and S); 12 (B and S); 13 (D); 17 (D); 20 (D); 27 (D and Z); 29 (D and S); 30 (Z); May 2 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 15 (Z); 17 (D, S and

Z); 18 (*D and Z); 20, nesting (Z); 21 (D and Z); 23 (Z); 27 (Z); 28 (Z); June 1 (Z).

Western Meadowlark—Jan. 25 (L); 26 (D); Feb. 18 (D); Mar. 9 (D); 23 (D); 30 (D); Apr. 2 (D and S); 6 (D); 12 (B and S); 13 (D and S); 17 (D); 20 (D); 27 (D and Z); 28, nesting (Z); 29 (D and S); 30 (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D, S and Z); 19 (Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z).

Orchard Oriole—May 4 (D and L); 10 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D and Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D).

Baltimore Oriole—April 23 (L); May 2 (D and Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (Z); 11 (D and Z); 12 (S and Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (*D and Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D).

Rusty Blackbird—March 23 (D); April 13 (L).

Brewer Blackbird—April 6 (L).

Bronzed Grackle—April 1 (S); 4 (S); 5 (S); 6 (D); 11 (S); 12 (B and S); 13 (D); 20 (D); 27 (D and Z); 30 (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D and Z); 19 (Z); 20, nesting (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z).

Purple Finch—May 4 (Z).

Goldfinch—January 25 (L); April 6 (D); 12 (B and S); 20 (D); 27 (D and Z); May 2 (Z); 4 (D); 7 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 17 (D and S); 18 (D and Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 25 (Z); June 1 (D).

Lapland Longspur—January 25 (Z).

Vesper Sparrow—April 12 (B and S).

Savannah Sparrow—April 2 (D and W); 6 (L); 11 (D and S);

12 (B and S); 13 (D); 20 (D); 27 (Z); 29 (D and S); 30 (Z); May 4 (D and Z); 10 (S and Z); 11 (D and S); 12 (B and S); 13 (D); 20 (D); 27 (Z); 29 (D and S); 30 (Z); May 4 (D and Z); 10 (S and Z); 11 (D and Z); 17 (D and S); 21 (D and Z).

Western Grasshopper Sparrow—April 20 (D); 27 (D); 30 (Z); May 4 (*D and Z); 10 (Z); 11 (D and L); 18 (S).

Leconte Sparrow—April 12 (B and S); May 4 (D and Z); 10 (Z); 17 (D and S).

Lark Sparrow—April 17 (D); 27 (D); May 4 (D).

Harris Sparrow—January 25 (L); 26 (D); March 9 (D); 23 (D); 30 (D); April 2 (D and W); 4 (S); 5 (S); 6 (D); 11 (S); 12 (B and S); 13 (D and S); 17 (D); 20 (D); 25 (S); 27 (D); 29 (D and S); 30 (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (S and Z); 13 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D and Z); 21 (D, S and Z).

Gambel Sparrow—April 29 (D); 30 (L); May 2 (D); 3 (*Z); 4 (D and Z); 10 (Z); 11 (D).

White-crowned Sparrow—April 30 (L); May 2 (D); 3 (*Z); 4 (D and Z); 10 (Z); 11 (D).

White-throated Sparrow—April 20 (D); May 4 (D and Z); 11 (D and L).

Tree Sparrow—January 11 (Z); 25 (L and Z); 26 (D); February 9 (D); 18 (D); March 9 (D); 23 (D); 30 (D); April 2 (D and W); 6 (D); 13 (D); May 2 (Z).

Western Tree Sparrow—January 25 (Z).

Chipping Sparrow—April 1 (S); 11 (S and W); 13 (L and S); 14 (S); 16 (Z); 17 (D); 27 (D and Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (Z); 18 (Z); 20 (Z); 21 (Z); 22 (Z); 23 (Z); 24 (Z); 25 (Z); 26 (Z); 28 (Z).

Clay-colored Sparrow—April 20 (D and L); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D, L and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 17 (D, S and Z); 18 (Z); 20 (Z); 21 (Z); 23 (Z).

Western Field Sparrow—April 2 (W); 6 (D); 13 (L); 20 (D); 27 (D); May 4 (D).

Slate-colored Junco—January 25 (L and Z); 26 (D); February 18 (D); March 9 (D); 23 (D); 30 (D); April 2 (D and W); 4 (S); 5 (S); 6 (D); 11 (S); 13 (S); 17 (D); 18 (S); May 3 (Z).

Song Sparrow—March 30 (D); April 2 (D and W); 6 (D); 11 (D and S); 12 (B and S); 13 (D); 20 (D); 27 (D); May 2 (Z); 3 (Z); 4 (Z); 10 (Z).

Lincoln Sparrow—April 5 (W); 13 (L); 20 (D); May 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 18 (Z).

Fox Sparrow—April 6 (D); 12 (B and S).

Towhee—March 30 (D); April 1(L); 2 (W); 6 (D); 11 (D and S); 17 (D); 20 (D); 27 (D); May 4 (D); 10 (Z); 14 (Z); 15 (Z); 18 (Z).

Arctic Towhee—April 30 (L); May 3 (Z); 4 (D and Z); 7 (Z); 11 (D and Z); 13 (Z); 15 (Z).

Cardinal—February 18 (D); March 9 (D); 23 (D); 30 (D); April 6 (D); 17 (D); 20 (D); 27 (D and Z); May 4 (D and Z); 10 (Z); 11 (L); 18 (D and Z); June 1 (D).

Rose-breasted Grosbeak—April 30 (L); May 1 (S); 2 (D and Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D, S and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D and Z); 20 (Z); 21 (D and Z); 23 (Z); June 1 (D).

Indigo Bunting—(W).

Dickcissel—April 30 (Z); May 4 (D and Z); 10 (Z); 11 (D, L and Z); 14 (Z); 17 (D, S and Z); 18 (D, S and Z); 19 (Z); 20 (Z); 21 (D); 22 (Z); 24 (Z); 25 (Z); 26 (Z); 28 (Z); June 1 (D and Z).

Scarlet Tanager—May 18 (Z); 25 (D).

Purple Martin—April 1 (W); 11 (D and S); 12 (B and S); 13 (D and L); 29 (D and S); May 11 (D); 18 (D).

Cliff Swallow—May 4 (L); 10, flock of hundreds (*S and Z); 11 (D); 18 (*Z); 20 (Z); 21 (D and Z).

Barn Swallow—April 20 (L); 29 (D and S); May 1 (Z); 2 (Z); 4 (D and Z); 7 (Z); 10 (S and Z); 11 (D); 13 (Z);

14 (Z); 15 (Z); 17 (D and S); 18 (S); 20 (Z); 21 (D and Z); 22 (Z); 24 (Z); 25 (D and Z); 28 (Z); June 1 (D).

Tree Swallow—April 27 (L); May 10 (S and Z); 11 (D); 20 (Z); 21 (Z).

Bank Swallow—April 27 (L); May 10 (*Z); 18 (Z); 20 (Z); 21 (D and Z).

Rough-winged Swallow—April 27 (L); 29 (D and S); May 4 (D and Z); 10 (S and Z); 11 (D); 17 (D and S); 18 (D and Z); 20 (Z); 21 (D and Z); 25 (D).

Northern Shrike—January 25 (L).

Migrant Shrike—March 23 (D); 30 (D); April 16 (Z); 27 (Z); 30, nesting (*Z); (paired with *excubitorides* male); May 4 (D).

White-rumped Shrike—April 27 (L); 30, nesting (*Z) (paired with *migrans* female).

Red-eyed Vireo—April 30 (L); May 12 (Z); 15 (Z); 16 (Z); 18 (Z); 20 (Z); 21 (Z); 22 (Z); 25 (D and Z); June 1 (D).

Warbling Vireo—April 20 (D and L); May 2 (Z); 4 (D and Z); 8 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 18 (Z); 20 (Z); 21 (Z); 22 (Z); 24 (Z); 25 (D and Z); 26 (Z); 28 (Z); June 1 (D).

Yellow-throated Vireo—May 25 (D).

Blue-headed Vireo—May 10 (*Z); 11 (*D and Z).

Bell Vireo—May 4 (D); 10 (S and Z); 11 (L); 13 (*Z); 17 (D and S); 18 (D and Z); 19 (D); 20 (Z); 21 (D and Z); 25 (D); 28 (Z); June 1 (D).

Black and White Warbler—May 10 (Z); 11 (D, L and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 18 (Z); 22 (Z); 25 (Z).

Blue-winged Warbler—May 8 at Havelock (Edward Wallace).

Nashville Warbler—May 11 (Z).

Orange-crowned Warbler—May 3 (Z); 4 (Z); 8 (Z); 10 (Z); 11 (D, L and Z); 12 (D and Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z).

Tennessee Warbler—May 2 (Z); 10 (*Z); 11 (Z); 12 (D, S and Z); 13 (Z); 14 (Z); 15 (Z); 18 (Z); 19 (Z); 20 (Z); 22 (Z); 25 (D and Z); June 1 (D).

Yellow Warbler—April 27 (Z); 29 (D and S); 30 (L); May 2 (Z); 4 (D and Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and S); 18 (D and S); 19 (Z); 21 (D and Z); 22 (Z); 23 (Z); 25 (Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z). (Z); 4 (D and Z); 10 (Z); 11 (D); 12 (Z); 13 (Z); 14 (Z); 18 (D).

Magnolia Warbler—May 10, one (Z); 11, several (D); 25, one (Z).

Chestnut-sided Warbler—May 14, one male (*Z).

Bay-breasted Warbler—May 14, one male (*Z).

Black-poll Warbler—May 10 (Z); 11 (D and Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 18 (Z); 20 (S and Z); 21 (D, S and Z); 25 (D and Z).

Palm Warbler—May 11, one (D).

Black-throated Green Warbler—May 10 (Z); 14, one male (*Z).

Ovenbird—May 10 (Z); 11 (D and Z); 12 (D and Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 18 (Z); 20 (Z); 21 (Z); 22 (Z); 25 (Z).

Grinnell Water Thrush—May 10 (Z); 11 (L); 20 (Z).

Louisiana Water Thrush—May 10 (Z); 11 (L).

Connecticut Warbler—May 18, a male (Z).†

Mourning Warbler—May 13, male (*Z); 14 (Z); 20, pair (Z); 25, one (Z); 28, one male (Z).

Maryland Yellowthroat—May 4 (D, L and Z); May 10 (S and Z); 11 (D and Z); 12 (S and Z); 13 (Z); 14 (Z); 15 (Z); 17 (D and S); 18 (D, S and Z); 20 (Z); 21 (D and Z); 22 (Z); 25 (D and Z); 28 (Z); June 1 (D).

Wilson Warbler—May 8 (Z).

Redstart—May 8 (Z); 10 (Z); 11 (L); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 18 (Z); 22 (Z); 25 (D and Z).

Pipit—April 13 (D); May 10 (Z); 11 (L).

Mockingbird—May 4 (L); 24 (Z); 25 (Z); 26 (Z); 27 (Z); 28 (Z); 30 (Z).

Catbird—May 3 (Z); 4 (D and L); 8 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (D and

†First report of this bird for the State (Editor).

S); 18 (D, S and Z); 19 (Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 25 (D and Z); 26 (Z); 28 (Z).

Brown Thrasher—April 20 (D, L and W); 24 (S); 27 (D and Z); 29 (D and S); 30 (L and Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15, nesting (Z); 16 (Z); 17 (Z); 18 (Z); 19 (Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25, nesting (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z).

Western House Wren—April 17 (W); 20 (D); 27 (D, L and Z); 29 (D and S); 30 (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15, nesting (Z); 18 (Z); 19 (Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25, nesting (D and Z); 26 (Z); 27 (Z); June 1 (D and Z).

Short-billed Marsh Wren—May 11 (L).

Brown Creeper—January 26 (D); March 9 (L); 23 (D).

White-bellied Nuthatch—January 26 (D); February 9 (D); 18 (D); March 9 (D and L); 23 (D); 30 (D); April 6 (D); 20 (D); May 4 (D).

Red-bellied Nuthatch—April 13 (S).

Long-tailed Chickadee—January 11 (Z); 25 (L); 26 (D); February 9 (D); 18 (D); March 9 (D); 23 (D); 30 (D); April 2 (D); 6 (D); 13 (D); 20 (D); 27 (D and Z); 30 (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (Z); 18 (Z); 19 (Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D).

Golden-crowned Kinglet—April 5 (W); 13 (L).

Ruby-crowned Kinglet—April 17 (D); 28 (S); May 10 (S and Z).

Wood Thrush—May 2 (D and Z); 3 (Z); 4 (D, L and Z); 7 (Z); 8 (Z); 10 (S and Z); 11 (D and Z); 12 (Z); 14, nest building (Z); 16 (Z); 17 (Z); 18 (Z); 19 (Z); 20 (Z); 21 (D and Z); 22 (Z); 25, nesting (D and Z); 26 (Z); 27 (Z); 28, nesting (Z); June 1 (D and Z).

Willow Thrush—May 2 (Z); 8 (Z); 10 (Z); 11 (Z); 12 (Z).

Gray-cheeked Thrush—May 4 (Z); 8 (Z); 10 (Z); 11 (S and Z); 12 (Z); 21 (Z).

Olive-backed Thrush—April 30 (L); May 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 18 (Z); 20 (Z); 21 (Z); 22 (Z); 23 (Z); 25 (D and Z); 26 (Z).

Hermit Thrush—(W).

Robin—January 26 (D); February 12 (W); 16 (L); March 9 (D); 23 (D); 30 (D); April 2 (D); 6 (D); 11 (D and S); 12 (B and S); 13 (D and S); 17 (D); 20 (D); 27 (D and Z); 29 (D and S); 30 (Z); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8, nesting (Z); 10 (Z); 11 (D and Z); 12 (Z); 13 (Z); 14 (Z); 15 (Z); 16 (Z); 17 (Z); 18 (Z); 19 (Z); 20 (Z); 21 (D and Z); 22 (Z); 23 (Z); 24 (Z); 25 (D and Z); 26 (Z); 27 (Z); 28 (Z); June 1 (D and Z).

Bluebird—March 9 (D and L); 23 (D); 24 (W); 30 (D); April 2, abundant (W); 6 (D); 11 (D and S); 13 (D); 16 (Z); 17 (D); 20 (D); 27 (D); May 2 (Z); 3 (Z); 4 (D and Z); 7 (Z); 8 (Z); 11 (Z); 12 (Z); 14 (Z); 23 (Z); 24 (Z); 25 (D and Z); 27 (Z); 28 (Z).

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